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A
DISQUISITION

O N

M E D I C I N E S
THAT DISSOLVE THE STONE.

I N W H I C H

Dr. CHITTICK'S S E C R E T

Is CONSIDERED and DISCOVERED.

I N T W O P A R T S.

The SECOND PART now first published,

And the FIRST considerably improved.

Nullius addictus jurare in verba magistri.

HOR.

B Y

ALEXANDER BLACKRIE.

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AND

MOST OBEDIENT HUMBLE SERVANT,

A. D.
1766

THE AUTHOR.

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Yours faithfully,
A. B. C.

Private Secretary to the President

The President

Washington

March 10th 1871

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I have the honor to acknowledge the receipt of your letter of the 10th inst. and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

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At the Rev. Mr. B. C.

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A DIS.

A
DISQUISITION
ON
MEDICINES
THAT DISSOLVE
The GRAVEL and STONE.

ABOUT five years ago a severe fit of the gravel supervening upon the return of a painful illness to which I have been long subject, and by which I was then confined, alarmed me much, as I continued several days in great agonies and danger.

B

In

In consequence of this unexpected incident, that disease, which is at least as calamitous as any of the other lasting disorders that afflict mankind; which more frequently occurs, as no age, sex or condition is exempted from its attacks, became so much the subject of my attention, that I have spared no pains to obtain the knowledge of every thing recommended to me as remarkably serviceable in this cruel distemper, either for the removal of its cause, or the alleviation of its paroxysms.

In the course of my enquiries, I was told of a medicine, which, for a
con-

considerable time past, has continued in high repute as a powerful lithontriptick ; and was informed, that about five years ago, it was obtruded upon the publick as a new discovery, and administered with success at Bath, by the late Dr. CHITTICK ; and, since his death, in London and Westminster, by his brother, the present Dr. CHITTICK, who, as his heir, became sole possessor of this remedy, and, after his brother's example, makes use of every artifice to keep it secret.

He is so remarkably circumspect, that, even in administering it, he entrusts it with no person unmixed.

He gives it to his patients in a large quantity of weak veal-broth, which is made by them according to his directions, and sent to him from day to day, for that purpose; and, not satisfied with this precaution, he gives to this medicated broth, as I am informed, different tastes, with various herbs and simples, the more effectually to conceal the principal ingredient.

This exuberance of caution rather excited me to a more diligent scrutiny into this medicine; as I inferred, from the extraordinary methods used for its concealment, that if I could but see it, even mixed in the broth,

I should be able by a proper investigation to discover that part in which its lithonthriptic quality chiefly resides.

I had also motives for my enquiry, arising from principles of general benevolence and humanity. The efficacy of Dr. CHITTICK's medicine was extolled in such high terms, as made me hope, that the stone would be no longer a formidable disease; but at the same time, so high a price was demanded for it, as very few could pay: and it being, besides, necessary for the patient either to send or to go daily, to the doctor's house, where alone it was dispensed, the benefit of an efficacious remedy for a most deplorable

disease was necessarily confined within a very small circle.

I, therefore, thought it my duty to use my utmost endeavours to extend an advantage, which the doctor is so unreasonably industrious to contract: and having, soon after, the good fortune to be introduced to several gentlemen, who had taken and were taking this broth, they communicated to me what they knew, and not only suffered me to taste it, but gave me a quantity sufficient for the experiments, which I proposed to make upon it.

I was thus enabled to ascertain, as I thought, beyond dispute or doubt, the nature and quality of the medicine

cine concealed in the broth ; and being impatient to communicate my discovery for the benefit of those who could not pay the doctor's price, or were in a situation which rendered it impossible either to go or send to his house, I published an account of my experiments, perhaps with too much brevity, in a monthly paper of intelligence, intitled, the Gentleman's Magazine, for October, 1763.

For this publication I have received the thanks of some who thought that I had, by a very fair and convincing investigation, evidently discovered that nostrum which has engrossed so much attention, and kept the publick so long in suspense.

I have, since that time, been importuned by others, both by letters and personal application, to republish those remarks in a separate treatise, on a supposition that their usefulness will be more extensively diffused: and, indeed, when I considered that the short medical hints, commonly inserted in such periodical and miscellaneous productions, are either overlooked, or not so attended to as to make any lasting impression, I was inclined to think that a regular and methodical disquisition, of the nature, causes, and cure of this distemper, so excruciating in its symptoms, and dangerous in its consequences, was proper, if not necessary, as more likely
to

to attract the notice of medical readers, to whom I now repeat an address that has been made by many writers upon many occasions,

— *Si quid novisti rectius istis,*

Candidus imperti: si non, his utere mecum.

HOR. Epist. 6. Lib. i.

and hope they will think it their duty to communicate such remedies, if any such there be, as experience has shewn to be more useful and efficacious.

In the mean time, for the reasons that I have assigned, I here republish my remarks on Dr. CHITTICK'S nostrum at large, and add such general and practicable observations on the disease

ease for which it is administered, as I have been able to make, as well from its effects upon myself as others.

The particulars which I learnt concerning Dr. CHITTICK's medicines are as follows.

The doctor orders two pounds of a crag-end of a neck of veal to be boiled in five quarts of water, till they are reduced to three, and each of his patients to send him, in a tin-bottle, pad-locked, to prevent, as he himself acknowledges, curious people from prying into his secret, three pints of this broth, free from all fat, and other impurities, every day; for the opening of which bottle he keeps one,
and

and the patient another key. This broth he returns with the medicines in it, and directs the whole to be taken in the day, one pint in the morning fasting, by a little at a time, so as to be an hour in taking the whole, fasting two hours afterwards ; the second pint at noon ; and the last pint in the evening, in like manner fasting two hours after each.

He also directs his patients to eat no salt meat, nor so much as salt with their meat ; no fat of any kind, no butter, no cream, nor any milk, unless skimmed ; no cheese, no fish, no eggs, no sauce of any sort, no tarts, no pastry, no fruit, no vegetables, except turnips, potatoes, and boiled onions,
and

and all these without sauce ; at the same time directing that potatoes should be taken but very sparingly.

As to drink, he prohibits all acids, and every thing that has the least tendency to acidity, as wine, beer, cyder, perry, and all other fermented liquors. He allows only water with a little brandy in it.

He permits his patients to eat beef, mutton, lamb, veal, ducks, chicken, and rabbits, without any sauce but their own gravy.

He also recommends such exercise, and such only, as can be taken without pain.

He

He tells his patients, that, if they expect benefit from his medicine, they must persevere in the use of it, and punctually follow his directions for a considerable time, three, four, five, and even six months ; which if they do, he makes no doubt of their cure : as a proof that his confidence is well founded, he wishes every person who applies to him for relief, would be searched, that the existence of a stone may be ascertained, before he enters upon his course, and says, if afterwards, upon repeating the experiment, a stone is still found remaining, that he desires nothing for his pains.

While

While he is administering his medicine, he is very assiduous in his visits, and minutely attentive to every thing that occurs. If the patient, at the first application, labours under any other disorder, or the paroxysm of the stone is very severe, he intermits his practice, till one is removed, and the other abated. And if any accidental disorder supervenes during the course, he suspends the use of his medicine till the patient is recovered. Through the whole course he mixes more or less of it with the broth, as particular constitutions and symptoms require.

The

The terms upon which he administers this medicine, are two guineas a week, during the whole time of the cure, indiscriminately from rich and poor : for this he gives no credit ; if he is not therefore regularly paid at every week's end, he refuses to medicate the broth. He at the same time tells his patients, that he does not look upon this sum as an equivalent, assuring them that the medicine he puts into their broth is dear, and costs himself very near as much ; and that he therefore expects a considerable premium besides, for his pains and trouble, after the cure is completed. He at first made no stipulation for any thing certain ; but finding himself, by submitting

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ting to his patients' consideration and generosity, greatly disappointed in his expectations, I am informed that, before he undertakes the cure, he now makes a positive bargain, and demands a very considerable sum.

When I first tasted this medicated broth, what struck me most was a strong flavour of tansy ; but, upon carefully tasting it again and again, I at last discovered, very plainly, the effect of an alkaline matter upon my palate, and immediately said to the patient, " I believe, Sir, I know the medicine ;" and asked whether he had ever tasted any thing like spirit of hartshorn in it? He answered in the affirmative ; and moreover said, that at
different

different times, he could distinguish this taste to be more or less predominant, and at that very time more perceptible than he ever observed it before.

I had afterwards the same accounts from others, whose broth I tasted ; and although I found the tansy flavour in all I ever met with, yet several persons informed me that the broth had sometimes a flavour of a very different kind. One gentleman in particular told me, that the doctor himself acknowledged to him that these tastes were given on purpose to disguise his medicine.

From this observation, I concluded that the ingredient which gave the alkaline taste was the medicine, and

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that

that the tanfy and other flavours were only intended to conceal it : and although I was told, that the doctor, in difcourse with feveral of his patients, greatly exclaimed againft the ufe of alkaline falts and fubftances, as extremely acrid and highly mifchievous, and complained that he failed of fuccefs in feveral inftances, only becaufe his patients, previous to his being employed, had burned up their infides with soap-lye, lime-water, and other fuch cauftic ftuff: thefe fpeeches rather confirmed me in my opinion, as I looked upon them to be no other than words of artifice, intended to divert the attention of his patients from that which it was fo much his intereft to conceal.

However, to be thoroughly satisfied that my conjecture was well founded, I made the following experiments.

I made veal broth according to the directions; and, after I had given the tanfy flavour, found, that by putting into it, at different trials, various quantities of alkaline fixed salts, or their solutions and preparations, I could give it a similar, though not quite the same, taste; which I imputed to this, that these salts, by long keeping, were either weaker, or otherwise altered from what they were at first: for such is the nature of these salts, that it requires the greatest care to preserve

C 2
serve

serve them in their pure pristine alkaline state; as, of all substances, they are most apt to attract and imbibe the moisture of the air, whereby their alkaline qualities, in which their lithontriptic virtue chiefly consists, are not only greatly impaired, but likewise, as the air is known to abound with acid particles, so much altered, as to become, in a great measure, salts of an intermediate nature, neither alkaline, nor acid, but neutral, as they are termed; such as, for example, is vitriolated tartar.

Being thus somewhat disappointed in my first trial, yet I did not despair; for, upon recollecting an observation of the most learned BOERHAAVE, that
by

by these alkaline salts, when mixed with quick-lime, a much more intense acrimony is obtained than any one of these substances separately are possessed of*, I resolved to make the experiment; which most effectually answered my purpose: for, in a solution of these salts, combined with quick-lime, I found the resemblance so exact, that those of the nicest taste and smell could not distinguish the doctor's broth from mine. I have therefore the greatest reason to conclude that this medicine is a solution of alkaline fixed

* “ Sal hic, ex calcis virtute ignea vere attracta in
 “ alcali fixum, igneum, acquisivit virtutem rodendi
 “ acutissimam, promptissimamque, quæ neque fuerat
 “ in alcali solo, neque in calce viva sincerâ.”

BOERHAAV. Element. Chemiæ, edit. Lugd. Bat.
 1732, Tom. ii. pag. 61.

salts joined with quick-lime, and therefore in reality no other than soap-lye.

I do not wish however to rest my opinion on this single proof ; it being so easy for the doctor to elude its force, by giving, as he formely has done, what tastes he pleases to the broth. I shall therefore corroborate it by such other evidences as, I presume, will establish it beyond the danger of confutation.

There is one property peculiar and essential to alkaline salts and substances, which no art can disguise : this is, their changing the fine blue colour of syrup of violets to a green, as acids change it to a red ; and these effects are so constant,

constant, that thereby a certain rule is established, by which we can judge whether any composition is of an alkaline or acid nature.

Knowing therefore that, if Doctor CHITTICK's broth was medicated with an alkaline substance, it would make syrup of violets green; I made the experiment, and it immediately shewed the alkaline property: I repeated it with my broth, and an exact similarity of colour was the issue.

I proceeded next to try if the efficacy of of my broth, as a menstruum to dissolve the stone, was likewise similar to that of the doctor's. I therefore took two equal fragments of the

same calculus, and put one of them into a small quantity of my broth, and the other into an equal quantity of his, and placed them both in an equal degree of heat: the consequence was, that both were very quickly dissolved, and both in the same space of time.

Having by these experiments evidently demonstrated, not only that my broth is similar to the doctor's in every sensible quality, but likewise that its efficacy is equal as a menstruum for dissolving a calculus immersed in it, and that this exact resemblance was effected by medicating it with soap-lye, the inference will be, that the doctor's broth is medicated with
the

the same, it being extremely improbable that different substances should in so many respects produce like effects.

Upon these combined evidences do I rest my proof; reserving for the succeeding pages my remarks on the regimen which the doctor directs his patients to observe, and the consideration of his pretences that his medicine is a new discovery, and more efficacious than any other hitherto known.

However, as the doctor puts more or less of his medicine into the broth, I am aware that I may be asked a question, which at first will seem important :

portant: How is the precise quantity he at all times uses to be ascertained? I answer, This knowledge is not at all necessary, as in administering such an acrid substance the quantity ought to be regulated by the sensation it gives, and the effects it produces. If the sensation which it gives is very troublesome and painful, the dose must be less, but if otherwise, more; as some degree of painful irritation is necessary to effect the solution of such hard substances. However, to avoid any occasion of cavilling upon this account, I shall propose the following methods, by which the exact quantity may be easily ascertained.

I ob-

I observed before, that the blue colour of syrup of violets is changed by alkalies to green, and by acids to red; and we can change these different colours from one to the other, by the addition of acids if green, and alkalies if red, as often as we please. Take therefore two equal quantities of alkalized broth, made green with syrup of violets, the quantity of the alkaly in one known, in the other not; put into that already known, a sufficient quantity of strong spirit of vitriol, drop by drop, shaking them, every time you add the acid, well together, till the colour is changed to red; and in like manner do so to the other, till it is likewise changed to
a si-

a similar red colour: thus the difference of the quantity of the acid for producing these effects in both, will be a certain index of the different quantity of the alkaly contained in each, and thus the problem is at once solved.

And besides, by observing the intenseness and remissness of the effervescence and heat, the constant concomitants of the transmutation of these different colours from one to the other, not only the quantity of the alkaline substance, but its different degrees of strength, - may be in a great measure estimated.

Another method still remains of ascertaining not only the quantity, but
likewise

likewise the quality, of the alkaly contained in the broth ; which is, by evaporating it in a glass or glazed earthen vessel to dryness. The residuum will very exactly shew what is wanted to be known : however, the trouble of frequently repeating this tedious operation may, for the reason above assigned, be very well spared.

Having thus far succeeded in my attempts to investigate this nostrum, and evidently proved it to be a solution of alkaline fixed salts combined with quick-lime, or soap-lye ; I shall proceed to enquire how far the internal use of such salts and substances may be relied on, as dissolvents of gravel and stones in the human kidneys

neys and bladder ; in what periods of the distemper, circumstances of the patients, and quantities, they may be properly and safely administered for these purposes.

Hippocrates was of opinion, that calculous matter, either in the kidneys or bladder, when concreted, and consolidated into stony-like substances, too large to pass through the common ordinary outlets, is absolutely, while it remains in these parts, indissoluble, and therefore that *nulli medicinæ locus* *; all efforts to do it were not only

* See LUDOVICUS DURETUS, his most excellent commentary upon the 472d observation of HIPPOCRATES's *Coacæ Prænotiones*, from which I have transcribed the following extract :

“ Temeraria est omnis medicina, pestifera, et sæpe
 “ mortifera, quæ frangendo vesicæ calculo adhibetur,
 “ cui

only vain, but frequently productive of very ill consequences.

A remarkable instance of this HIPPOCRATES has given. This history, wherein the diagnostic signs of a stone in the bladder are not only most accurately described, but likewise the excruciating symptoms and fatal event of having, in that case, given a medicine potently diuretic, are shewn, is related in his Epidemics*.

Several

“ cui profuerit vidi adhuc neminem, permultos quibus
“ exitio illa fuit.”

Comment. in Hip. Coac. Prænot. Cap. 22. De
Morb. Vesic. Sect. 5.

* “ Larissæ Theophorbi puer calculosam habebat
“ vesicam, glutinosum quidpiam permeiebat, idque diffi-
“ culter cum sævo dolore tum initio tum faciens finem
“ meiendi. Præputium manibus confricabat. Hic cum
“ bibisset acerrimum diureticum, nihil in vesicam seces-
“ sit, nihil e vesica excessit: vomuit autem multum
“ puri-

Several of the Ancients, therefore, thinking that in these circumstances there is only one method of giving relief, recommended extraction, though a dangerous, and too often fatal, operation; “ *Sed anceps remedium melius quam nullum;*” and, indeed, innumerable have been the instances of its most surprizing success: they, however, confined that operation to the bladder only, where, for the most part, these larger concretions are to be found.

“ puriforme et bilem. Ac tum hujusmodi altera trans-
 “ mittebat infra per alvum. Venter dolebat admodum,
 “ et intus incendio conflagrabat: reliquum vero corpus
 “ frigidius erat glacie. Omnibus membris captus est,
 “ nec voluit quicquam assumere. Huic magna erat
 “ ipsius alvi exulceratio a forti nimium medicamento
 “ vel pharmaco. Periit a potione tertium agens diem.”

Hippocrat. Lib. v. Epidem. Interprete Lud. Dureto,
 loco citato.

We

We know, however, that for some centuries past, nephrotomy has been recommended, in consequence, no doubt, of a precept of HIPPOCRATES, who, after enumerating various methods of giving relief for tophaceous concretions in the kidneys, directs an incision, in order to discharge the matter contained in an abscess formed from too great a quantity of sand or gravel confined in them, the existence of such an abscess being first evidently ascertained by an external tumor*.

* “ Ubi vero intumuerit et extuberarit, sub hoc tempus juxta renem secato, et extracto pure arenam medicamentis urinam cientibus curato. Si enim sectus fuerit evadendi spes est, alioqui morbus hominem ad mortem usque comitatur.”

Hippocratis opera, Foessio interprete, Edit. Genev.

1657, pag. 539.

D

This

This operation has not only been recommended, but actually performed in two instances with remarkable success: once at Paris, in the reign of CHARLES the Eighth, at which time the practice of surgery was but in its infancy in France, upon a condemned malefactor, with such success, that he lived many years after the operation, in a perfect state of health.

This happened an hundred years before ROUSETTUS wrote upon this subject; who, with great energy, endeavoured to enforce this practice. This case, taken from a French historian, is related in the History of Physic, by Dr. FREIND, who himself, though

though he acknowledged it to be a very dangerous and uncertain operation, seems to approve of it. The other more recent operation was performed at Padua, by DOMINICO MARCHETTE, upon Mr. HOBSON, the English consul at Venice, and is recorded in the Philosophical Transactions, N^o. 223.

Yet, we find, that for a considerable time past, attempts have been made to dissolve calculous substances ; and for that purpose, alkaline fixed salts have been esteemed the most efficacious.

BASILIIUS VALENTINUS, a famous chemist, of the 15th century, con-

trived a medicine for the gout and gravel, for the preparation of which, he used an alkaline fixed salt, made from vine-twigs, cut in the beginning of the month of March, preferably to any other alkaly*.

And SENNERTUS makes mention of a lithonthriptic medicine which was in great esteem, and much used by people of distinction in his time, consisting of one ounce of salt of tartar, dissolved in a pint of parsley-water, and afterwards tinged yellow with orange-peel †.

* BOERHAAVE, Element. Chem. Tom. ii. pag. 53.

† SENNERTUS, Praxis Medica, Cap. De Calculo Vesicæ.

RIVERIUS also, from SENNERTUS, takes notice of this medicine*.

These notices, however, were but little regarded, and the antient opinion almost universally prevailed, till lately the Parliament of Great Britain ordered a premium of 5000*l.* to be given to Mrs. JOHANNA STEPHENS, for discovering and publishing her lithonthriptic medicines; a favourable report of their efficacy having been given by the gentlemen, who were appointed trustees, and employed to make that enquiry.

The directions for preparing and administering these medicines are infer-

* RIVERII Praxis Medica, Cap. De Calculo Vesicæ.

ted in the Gentleman's Magazine, for June 1739, vol. ix. pag. 298; but, as a compleat collection of these papers is very scarce, I shall here transcribe these articles.

*“ A full discovery of the medicines
 “ given by me JOHANNA STEPHENS,
 “ for the cure of the stone and gravel;
 “ and a particular account of my me-
 “ thod of preparing and giving the
 “ same.*

*“ MY medicines are a powder, a
 “ decoction, and pills.*

*“ The powder consists of egg-shells
 “ and snails, both calcined.*

“ The decoction is made by boiling
“ some herbs (together with a ball,
“ which consists of soap, swine’s cresses
“ burnt to a blackness, and honey)
“ in water.

“ The pills consist of snails cal-
“ cined, wild carrots seeds, burdock
“ seeds, ashen keys, hips and hawes,
“ all burnt to a blackness, soap and
“ honey.

“ The Powder is thus prepared.

“ Take hen’s egg-shells, well drain-
“ ed from the whites, dry and clear;
“ crush them small with the hands,
“ and fill a crucible of the twelfth

“ fize (which contains nearly three
 “ pints) with them lightly, place it
 “ on the fire, and cover it with a tile;
 “ then heap coals over it, that it may
 “ be in the midst of a very strong
 “ clear fire, till the egg-shells be cal-
 “ cined to a greyish white, and ac-
 “ quire an acrid salt-taste. This will
 “ take up eight hours at least. Af-
 “ ter they are thus calcined, put them
 “ into a dry clean earthen pan, which
 “ must not be above three parts full,
 “ that there may be room for the swell-
 “ ling of the egg-shells in flacking.
 “ Let this pan stand uncovered in a
 “ dry room for two months, and no
 “ longer: in this time the egg-shells
 “ will become of a milder taste, and
 “ that part which is sufficiently cal-
 “ cined

“ cined will fall into a powder of such
 “ a fineness as to pass through a com-
 “ mon hair-sieve, which is to be done
 “ accordingly.

“ In like manner take garden snails,
 “ with their shells, cleaned from the
 “ dirt; fill a crucible of the same
 “ size with them whole, cover it, and
 “ place it on the fire as before, till
 “ the snails have done smoaking, which
 “ will be in about an hour, taking
 “ care that they do not continue on
 “ the fire after that. They are then
 “ to be taken out of the crucible, and
 “ immediately rubbed in a mortar to a
 “ fine powder, which ought to be of
 “ a very dark grey colour.

“ *Note.*

“ *Note.* If pit-coal be made use of,
 “ it will be proper, in order that
 “ the fire may the sooner burn
 “ clear on the top, that large
 “ cinders, and not fresh coals, be
 “ placed upon the tiles which
 “ cover the crucibles.

“ These powders being thus pre-
 “ pared, take the egg-shell powder of
 “ six crucibles, and the snail powder
 “ of one; mix them together, rub
 “ them in a mortar, and pass them
 “ through a cypress sieve. This mix-
 “ ture is immediately to be put into
 “ bottles, which must be close stop-
 “ ped, and kept in a dry place for
 “ use. I have generally added a small
 “ quantity

“ quantity of swine’s-creffes, burnt to
“ a blackness, and rubbed fine ; but
“ this was only with a view to dis-
“ guise it.

“ The egg-shells may be prepared
“ at any time of the year ; but it is
“ best to do them in summer. The
“ snails ought only to be prepared in
“ May, June, July, and August ; and
“ I esteem those best which are done
“ in the first of these months.

“ The Decoction is thus prepared.

“ Take four ounces and a half of
“ the best alicant soap, beat in a mor-
“ tar with a large spoonful of swines-
“ creffes burnt to a blackness, and as
“ much

“ much honey as will make the whole
“ of the consistence of paste. Let
“ this paste be formed into a ball.

“ Take this ball and green camo-
“ mile, or camomile flowers, sweet
“ fennel, parsley and burdock leaves,
“ of each one ounce, (when they are
“ not green, take the same quantities
“ of roots) cut the herbs, or roots,
“ slice the ball, and boil them in two
“ quarts of water half an hour; then
“ strain it off, and sweeten it with
“ honey.

“ *The Pills are thus prepared.*

“ Take equal quantities, by mea-
“ sure, of snails calcined as before, of
“ wild

“ wild carrot seeds, burdock seeds,
 “ ashenkeys, hips and haws, all burnt
 “ to a blackness, or, which is the same
 “ thing, till they have done smoaking;
 “ mix them together, rub them in a
 “ mortar, and pass them through a
 “ cypress sieve; then take a large
 “ spoonful of this mixture, and four
 “ ounces of the best alicant soap,
 “ and beat them in a mortar with as
 “ much honey as will make the whole
 “ of a proper consistence for pills;
 “ fixty of which are to be made out
 “ of every ounce of the composition.

*“ The method of giving these medicines
 “ is as follows.*

*“ When there is a stone in the
 “ bladder or kidneys, the powder is
 “ to be taken three times a day, viz.
 “ in the morning after breakfast, in
 “ afternoon about five or six, and at
 “ going to bed. The dose is a dram
 “ averdupoize, or fifty-six grains,
 “ which is to be mixed in a large
 “ tea-cup full of white wine, cyder,
 “ small punch ; and half a pint of the
 “ decoction is to be drunk, either cold
 “ or milk warm, after every dose.*

*“ These medicines do frequently
 “ cause much pain at first ; in which
 “ case*

“ case it is proper to give an opiate,
 “ and repeat it as often as there is
 “ occasion.

“ If the person be costive during
 “ the use of them, let him take as
 “ much lenitive electary, or other laxa-
 “ tive medicine, as may be sufficient
 “ to remove that complaint, but not
 “ more : for it must be a principal
 “ care at all times to prevent a loose-
 “ ness, which would carry off the me-
 “ dicines; and if this does happen,
 “ it will be proper to increase the
 “ quantity of the powder, which is
 “ astringent; or lessen that of the
 “ decoction, which is laxative; or use
 “ take some other suitable means, by
 “ the advice of physicians.

“ During

“ During the use of these medi-
 “ cines, the person ought to abstain
 “ from salt meats, red wines, and milk;
 “ drink few liquids, and use little ex-
 “ ercise, that so the urine may be more
 “ strongly impregnated with the me-
 “ dicines, and the longer retained in
 “ the bladder.

“ If the stomach will not bear the
 “ decoction, a sixth part of the ball
 “ made into pills, must be taken after
 “ every dose of the powder.

“ Where the person is aged, of a
 “ weak constitution, or much reduced
 “ by loss of appetite, or pain, the
 “ powder must have a greater propor-
 “ tion

“ tion of the calcined snails than ac-
 “ cording to the foregoing direction ;
 “ and this proportion may be increased
 “ suitably to the nature of the case,
 “ till there be equal parts of the two
 “ ingredients. The quantity also of
 “ both powder and decoction may be
 “ lessened, for the same reasons. But
 “ as soon as the person can bear it, he
 “ should take them in the above-men-
 “ tioned proportions and quantities.

“ Instead of the herbs and roots be-
 “ fore-mentioned, I have sometimes
 “ used others, as mallows, marshmal-
 “ lows, yarrow red and white, dande-
 “ leon, water-creffes, and horse-radish
 “ root, but do not know any material
 “ difference.

“ This is my manner of giving the
“ powder and decoction. As to the
“ pills, their chief use is in fits of the
“ gravel, attended with pain in the
“ back and vomitings, and in sup-
“ pression of urine from a stoppage
“ in the ureters. In these cases, the
“ person is to take five pills every
“ hour, day and night, when awake,
“ till the complaints be removed.
“ They will also prevent the forma-
“ tion of gravel and gravel-stones, in
“ constitutions subject to breed them,
“ if ten or fifteen be taken every
“ day.

May 16, 1739.

Signed,

“ J. STEPHENS.”

That

That these gentlemen had sufficient evidences at that time to justify their recommendation of those medicines, I do not doubt; yet subsequent experience has shewn them to be not so well adapted to the ends proposed as might be wished: they being a medley of soap, ill-prepared alkaline substances, and such other ingredients as seem calculated rather to retard than promote their effects; so nauseous and oppressive to the stomach, especially as they are ordered to be given so frequently, and in such large quantities, that it requires the greatest resolution imaginable, to continue such a course for the time necessary. And after all, though they had confessedly given

great relief, in many instances, yet in many more they had failed for Dr. JURIN has observed, that several patients, after taking them for several months together, without any benefit, had submitted to be cut rather than to use any longer a medicine so extremely nauseous, which had generally increased their pains, without bringing any thing away *.

But, although these medicines, on account of the defects or inconveniences before-mentioned, have been often found inadequate to the purpose; yet this good has ensued from the publication of them, that several men, eminent in the practice of phy-

* Abstract of Dr. JURIN's case, p. 5.

fic, and others, became more attentive to notices of this kind: and to their great assiduity in discovering the nature and qualities of stony substances it is owing, that the solution of hard calculous concretions is, by the use of internal remedies, now found to be practicable, and alkaline fixed salts and substances, properly and cautiously administered, to be the most efficacious dissolvents.

In particular, the late Dr. DAVID HARTLEY, of Bath, though a strenuous advocate for Mrs. STEPHENS's medicines, yet, conscious of their defects, caused a paper to be inserted in the Gentleman's Magazine for the month of February, 1746. vol. xvi. p. 77. en-

titled, *Directions for preparing and administering Mrs. STEPHENS's Medicines for the Stone, in a solid form.* Which, for the reason above assigned, I have likewise here transcribed.

“ 1. Take of Alicant or Castile-soap
 “ eight ounces, of powdered quicklime
 “ one ounce, of salt of tartar a dram.
 “ Shave the soap, mix it with the
 “ lime and salt, and beat all into a soft
 “ mass, by adding thereto as much wa-
 “ ter as is necessary for this purpose.

“ 2. The weights here intended are
 “ the apothecaries weights ; but the
 “ medicine may be prepared by any
 “ others, care being taken to preserve
 “ the proportion of the ingredients here
 “ directed ;

“ directed ; that is, to make the lime
“ an eighth part of the soap, and the
“ salt an eighth part of the lime.

“ 3. Quicklime may be reduced to
“ powder for the purpose of this me-
“ dicine, either by dipping it in wa-
“ ter for a few moments, or by ex-
“ posing it to the air for some days.
“ This powder is to be passed through
“ a fine sieve.

“ 4. The lime which is made from
“ lime-stone is stronger than that made
“ from chalk, the shells of eggs, oy-
“ sters, &c. However, this last is suf-
“ ficiently strong for the general pur-
“ poses of this medicine, when high-
“ ly calcined and fresh. And, on
E 4 “ the

“ the contrary, the strongest stone-
 “ lime may be made weaker at plea-
 “ sure, by being exposed to the air,
 “ or by repeated effusions of fresh wa-
 “ ter.

“ 5. Strong lime is a more powerful
 “ solvent than weak ; but then it is
 “ more apt to occasion irritation and
 “ pain in the urinary passages. New
 “ soap appears also to be more irritat-
 “ ing and more powerful than old.

“ 6. The chief use of the salt of
 “ tartar is to preserve the mass soft.
 “ This is necessary, that the stomach
 “ may digest it easily, and the bowels
 “ absorb the efficacious part in its pas-
 “ sage along them. If therefore it
 “ should

“ should at any time grow so hard and
“ dry as to be heavy on the stomach,
“ or pass through the body undissolved,
“ it will be proper to beat it over
“ again, with the addition of a little
“ more water and salt of tartar. The
“ same purpose may be obtained by
“ using a weaker lime, or a less pro-
“ portion of a strong one.

“ 7. This medicine must not be
“ prepared in a copper or brass mor-
“ tar, lest it should corrode the metal,
“ receive a taint from it, and so occa-
“ sion sickness or vomiting.

“ 8. The method of administering it
“ is as follows: Make each ounce of
“ the mass into six rolls of about two
“ inches

“ inches in length, and a little taper
 “ at each end ; and let the person who
 “ has the stone in the kidneys, or
 “ bladder, take from eighteen to twen-
 “ ty-four of these rolls, that is, from
 “ three to four ounces of the mass,
 “ every day. Less than three ounces
 “ every day ought not to be depend-
 “ ed upon for the solution of the stone ;
 “ and I cannot authorize any one
 “ from experience to take more than
 “ four. Three, four, or five rolls may
 “ be taken at once, and at any hour
 “ of the day, according as each per-
 “ son finds his stomach best able to
 “ digest them.

“ 9. If

“ 9. If one of these rolls be laid
“ length-ways on the tongue, and then
“ a mouth-full of water taken and
“ swallowed, the roll will slip down
“ along with the water, so as scarce
“ to be perceived in its passage.

“ 10. If the patient drinks some
“ lime-water and milk for his com-
“ mon drink, during the use of this
“ medicine, the cure will be forward-
“ ed thereby : but then it will pro-
“ bably subject him to a greater de-
“ gree of irritation and pain in the
“ urinary passages ; and therefore is
“ not adviseable in cases where these
“ complaints are already considerable.
“ Lime-water is made by pouring a
3 “ gallon

“ gallon of cold water upon a pound
 “ of quick-lime, stirring it about, and,
 “ after it has stood for two or three
 “ hours, passing it through a filtering
 “ paper.

“ II. Where the irritation and pain
 “ are very great, also where the pa-
 “ tient is subject to discharge much
 “ blood with his urine, the medicines
 “ ought to be prepared with a very
 “ mild lime and soap, and even with
 “ a less proportion of lime than ac-
 “ cording to the foregoing directions.
 “ The salt of tartar may also be left
 “ out, as the mass will not now be so
 “ apt to grow dry. But it seems re-
 “ quisite to give the medicine in due
 “ quantities in such cases, lest the
 “ stone

“ stone should happen to be of so
 “ brittle a nature as to fall into frag-
 “ ments, with sharp edges and corners,
 “ from a small quantity ; at the same
 “ time that, through want of due
 “ quantities, the urine is not powerful
 “ enough to make these edges and cor-
 “ ners grow rotten, and fall off from
 “ the fragments ; but, on the contrary,
 “ should suffer these fragments to con-
 “ tinue rough and hard, and thereby
 “ to occasion great irritation, pain, and
 “ danger. For the same reason, the
 “ medicines ought not to be intermit-
 “ ted, whilst rotten fragments are
 “ voided.

“ 12. Where a person cannot swal-
 “ low the rolls, nor take a sufficient
 “ quantity

“ quantity of the above-mentioned
 “ medicine in any other form, the fol-
 “ lowing may be directed in its stead,
 “ viz. Mix equal parts of powdered
 “ quick-lime and salt of tartar toge-
 “ ther, and let the patient take a quar-
 “ ter of an ounce of this mixed pow-
 “ der, in half a pint of milk, three
 “ or four times a day.

“ This medicine seems to be of
 “ about equal efficacy with that be-
 “ fore-mentioned, but more apt to in-
 “ crease the pain and irritation. It
 “ cannot be taken in due quantity in
 “ any other vehicle besides milk, as
 “ far as I have been able to discover;
 “ and when not taken in due quanti-
 “ ty, it appears to me to expose the
 “ patient

“ patient to the hazards mentioned in
 “ the last article, in a greater degree
 “ than the foregoing medicine. This
 “ powder ought to be mixed with the
 “ milk only a few moments before it
 “ is taken ; otherwise it will acquire
 “ a great increase of acrimony. Pot-
 “ ash, purified by solution, filtration,
 “ and evaporation, or a fixed alkaline
 “ salt of any kind, may be used in-
 “ stead of salt of tartar, both in this
 “ and the foregoing medicine.

“ 13. A sixth or eighth part of ei-
 “ ther of these medicines, taken every
 “ day, seems sufficient to prevent the
 “ formation of gravel and gravel-stones.
 “ Half an ounce of mere soap, or a
 “ pint of strong lime-water, taken
 “ every

“ every day, may also in general be
 “ sufficient for the same purpose ; nei-
 “ ther is there any reason to apprehend
 “ that any of these methods will be
 “ hurtful to the health, though con-
 “ tinued for many years. On the con-
 “ trary, soap, lime, and lime-water,
 “ appear to be very salutary to most
 “ persons in the decline of life, and to
 “ be excellent remedies in the gout,
 “ in jaundices, and in all such dis-
 “ orders of the first passages, as arise
 “ from, or are attended by, acidities
 “ there. Soap alone, in the quantity
 “ of half an ounce or an ounce a day,
 “ is very useful in habitual consti-
 “ tutions, and in obstructions of the ca-
 “ tamenia, or tendencies thereto, espe-
 “ cially if there be previous pains ; as
 “ is

“ is strong lime-water, mixed with an
 “ equal quantity of milk, and used for
 “ common drink in habitual looseneffes.
 “ I am also inclined to believe, that a
 “ diet, consisting of bread, milk, and
 “ lime-water, alone, if rigidly adhered
 “ to, and persisted in for a sufficient
 “ time, would be of the gratest service
 “ in many scorbutic and scrophulous
 “ cases.

Nov. 2, 1745.

“ D. HARTLEY.”

Whatever new degree of efficacy
 these medicines, thus altered and cor-
 rected, might appear to the doctor to
 have obtained, yet that many defects

F

and

and inconveniencies remain, the following remarks will sufficiently prove.

I. Though, by the doctor's prescription, the superfluous and useless ingredients in Mrs. STEPHENS'S medicines are entirely rescinded, yet those substituted in their stead are not without their imperfections, being very little else than Castile soap, and even that vitiated by one eighth part of an absorbent earth, such as quick-lime partly becomes when slacked as is directed; it is therefore not likely to dissolve calculous concretions, or promote the good effects of the soap, which, being in the largest quantity, must be supposed to have been esteemed by him
the

the most important part of this composition.

2. It is true that salt of tartar is ordered to be added ; but so little, being only about a sixty-fifth part of the whole mass, and with a view only to preserve it soft, that little good can be expected from it ; whereas this salt, being, as will afterwards appear, the most efficacious ingredient, ought to have been prescribed in the largest quantity. From this particular alone, it plainly appears to me, that he was not at that time thoroughly acquainted with his subject ; and therefore the inconsistencies in his subsequent directions are easily accounted for.

3. The quantity of this mass ordered to be taken, being from at least three or four ounces every day, is so great, that the objection made to Mrs. STEPHENS's medicines upon this account, recurs. This, even he himself seemed sensible of; for to a person who cannot swallow the rolls, nor take a sufficient quantity of the medicine in any other form, his directions are, that the following mixture be used in its stead: "Mix equal parts of
 " powdered quick-lime and salt of tar-
 " tar together, and let the patient take
 " a quarter of an ounce of this mixed
 " powder in half a pint of milk, three
 " or four times a day."

4. As

4. As an equal quantity of salt of tartar, or any other pure fixed alkaline salt, and quick-lime, is the exact proportion of these substances, without any farther addition, for making the lapis septicus or potential caustic*, a small round piece of which, not exceeding the size of a silver penny, when applied and confined properly to the skin for some hours, will produce a very deep eschar; the alternative proposed is not a little surprising; for though, by being mixed in such a quantity of milk, its acrid particles may be so far separated, and so weakened by that separation, as not to be immediately productive of such effects,

* Pharmacop. Edinburgensis, edit. 1756.

yet what ill consequences may not be dreaded from three quarters to an ounce of this being taken every day, for any length of time?

It is remarkable that, immediately before he prescribes the powder, he cautions against the use of such medicines as irritate greatly, and give much pain, and, to avoid such inconveniency, orders his medicine to be prepared with a very mild lime and soap, and even with a less proportion of lime, leaving out the salt of tartar; yet he acknowledges the powder, which he substitutes for such medicine, in a quantity of only equal efficacy, to be more apt to increase pain and irritation, and even so acrid, that a due quan-

tity cannot be taken in any vehicle but milk, nor even in that, except it be drunk a few moments after it is mixed, to prevent it's acquiring an increase of acrimony : What then can we think ? Surely, that in this respect he is inconsistent with himself, and that therefore his directions cannot be trusted.

These animadversions may perhaps be looked upon by some as too severe ; but as I have frequently heard of, and in a few instances seen, bad effects from acrid substances given in too large quantities, I think that I cannot sufficiently recommend the practice of proceeding leisurely, beginning at first with a small quantity, and by a constant attention, either augmenting or

diminishing it as circumstances and consequences indicate ; for, what cannot immediately be done by force, yet in time may be effected by easier methods*.

“ The late learned Dr. JURIN, who
 “ for many years was greatly afflicted
 “ with the gravel, being at last convinced that he had a stone in his
 “ bladder, too large to be got rid of
 “ by ordinary means, began seriously
 “ to consider what course he should
 “ take to avoid being cut ; the result
 “ was, that he turned his thoughts to
 “ the lixivium or lye that soap is made

* Quid magis est saxo durum ? Quid mollius unda ?
 Dura tamen molli saxa cavantur aqua.

OVID.

“ of,

“ of, being inclined to think that the
 “ virtue of the soap resided principally
 “ in the lye ; and that its efficacy for
 “ dissolving the stone was rendered less
 “ by the addition of such a quantity
 “ of oil or fat as was necessary to make
 “ it into soap * ; and not only so, but
 “ the medicines rendered thereby more
 “ nauseous and bulky. He was con-
 “ firmed in this opinion from a careful
 “ perusal of the experiments made by
 “ his ingenious and learned friend the
 “ late reverend Dr. HALES, to whom
 “ the world is so much indebted upon
 “ this, and many other accounts ; and
 “ the more so from the following ex-

* The quantity of oil in Spanish soap is computed
 to be above two third parts of that composition. See
 Dr. ALSTON's Dissertation on Quick-lime and Lime-
 water, Edit. 2. p. 26.

“ periment

“ periment which came nearer to his
 “ own case. He mixed a tea-spoon-
 “ ful of the lixivium with about two
 “ ounces of river water, and, by a cold
 “ infusion in this mixture a rugged red
 “ stone, of the size of a small pea, he
 “ had formely voided, was dissolved
 “ in two days.

“ Being thus apprized of the supe-
 “ rior lithonthriptic quality of soap-
 “ lye, and knowing that it had been
 “ taken by several persons without in-
 “ convenience, he determined to make
 “ use of it: and the event answered
 “ his expectation; for, by a constant
 “ perseverance in taking it every day
 “ for above six months, he, by the
 “ blessing

“ blessing of God, found himself per-
 “ fectly cured.

“ The lixivium or lye that he used
 “ at first, is what is commonly called
 “ the capital soap-lees, but afterwards
 “ the lixivium of the first run-
 “ ning, which is much stronger. Yet,
 “ even that was found to vary some-
 “ times very considerably with re-
 “ gard to strength; and though he
 “ himself could pretty nearly judge of
 “ the strength of every fresh parcel,
 “ and increase or lessen the dose he
 “ took accordingly; yet this could
 “ not be done by his patients, espe-
 “ cially by those he seldom or never
 “ saw after he had once settled them
 “ in a proper course of taking this me-
 “ dicine: and besides, the soap-lye
 “ was

“ was often attended with a smell and
 “ taste so exceedingly offensive, that
 “ many persons could not keep it upon
 “ their stomachs, and were obliged
 “ to discontinue it upon that account.

“ These considerations put him up-
 “ on thinking whether a medicine
 “ might not be contrived of the same
 “ ingredients, and consequently of the
 “ same virtue, yet without the above-
 “ mentioned inconveniencies ; which
 “ after several trials he happily effec-
 “ ted, by the assistance of his friend
 “ Mr. LITTLEBURY, apothecary ; and
 “ since that time, this was what he used
 “ for himself and patients instead of
 “ the common soap-lye.”

This

This particular preparation, however, he did not think proper to communicate to the public, and only said that it might be had in any quantity of Mess. LITTLEBURY and LANGLEY, apothecaries, opposite to Austin-Fryars, Old Broad-street, London, .

I have often heard this concealment censured, as a lucrative artifice, below the dignity of his character: but, as these persons assisted him in preparing the medicine, he was excusable in giving them this recompence for their trouble; the rather, as by his directions it was sold cheap, one shilling and six pence being the price demanded for an half pint bottle, which
would

would keep its virtue at any distance, so that people not rich might be supplied on easy terms, and the indigent succoured by benevolent persons without any great expence. Thus, the objection made to Dr. JURIN's manner of concealing and administering his medicine is intirely obviated.

Yet as those who are at a very great distance, may wish to know this medicine, in order to have it always ready in case of exigency, that I may satisfy them, as far as I am able, I shall subjoin my conjectures about it.

The doctor's objection to the common soap-lye, is not its want of efficacy, but its disagreeable smell, and
taste,

taste, and its not being at all times to be had of the same degree of strength : I therefore suppose that his lixivium is the solution of a precise quantity, by weight, of depurated rhenish-wine tartar, and oyfters or cockle-shells, both recently and well calcined, the tartar till it acquires a pale blue colour, the shells till they are perfectly and thoroughly white, in constantly the same proportionate quantity, by measure, of pure light water.

A lixivium, thus prepared, must, if well kept from the air, be always of equal strength, and may be more immediately taken than soap-lye, for salt of tartar is more pure than any other of the alkaline salts, which soap-boilers, for the most part, make use of;
and

and I much doubt whether the calcination of their quick-lime is so well attended to as it ought to be. Dr. WHYTT observes, that in the calcination of cockle and oyster-shells, if any part of them is bluish and not properly calcined, the water poured on them will get a very disagreeable sulphurous taste *. The disagreeable and nauseous smell and taste, so common to their soap-lye, may therefore be attributed to an imperfect calcination, and I think by the preparation here directed will in a great measure be prevented.

To ascertain the exact proportions of these different ingredients, which

* Dr. WHYTT's Essay on the Virtues of Lime-Water and Soap in the Cure of the Stone. Edit. 3. p. 31, 32.

the doctor made use of in making his soap-lye, is the difficulty ; however, I think they may be pretty nearly guessed at, by the following methods.

The doctor's medicine is a pale-coloured transparent lixivium, and a white calcareous sediment. First, therefore, exactly weigh any quantity of it, for example a pint ; then separate the clear liquor by filtration, and thoroughly dry and weigh the sediment : thus the quantity of quick-lime contained in this composition will be nearly ascertained : after this, evaporate the clear liquor obtained by filtration to dryness, and weigh the residuum ; which will, in like manner, indicate the proportion of the alkaline salt ; then subtract

G tract

tract the weight of these two last ingredients from the first quantity, and the remainder will be the proportion of water in which they were mixed.

If, after all, these calculations should be found deficient, I can only say that a due attention ought to be had to the strength or alkaline acrimony of this medicine, and indeed of any other of that kind, for to this their lithronthriptic virtue is chiefly owing; by the knowledge of this therefore must be regulated the due administration of the like substances; and how to obtain this knowledge I have already shewn.

“ The quantity of the lixivium the
 “ doctor began with was very small,
 “ being

“ being only twenty drops twice a day ;
 “ but, by a gradual increafe, he was
 “ enabled to take from an ounce to
 “ an ounce and an half in that fpace
 “ of time. To thofe, therefore, who
 “ wanted to get rid of a ftone of any
 “ confiderable bignefs, or a large quan-
 “ tity of gravel, he generally prefcrib-
 “ ed an ounce, or thereabout, to be
 “ taken every day in three or four
 “ dofes ; beginning with a drachm
 “ weight in a dofe three times a day,
 “ and increafing it by degrees ; but,
 “ afterwards, he thought that about a
 “ third of an ounce in every four and
 “ twenty hours would be fufficient to
 “ keep them clear of gravel.”

The regimen he observed was, only to abstain from every thing that could be suspected of lessening the efficacy of his medicine; which being highly alkaline, he forbore all vinegar, fruits, and the austere wines.

The reason why he did not separate the clear part of his lixivium from the sediment, was probably a supposition that it might thereby be preserved longer in the first alkaline state; for the quick-lime, its active particles being dissolved, was become partly an absorbent earth, and therefore might contribute to absorb and render ineffectual the acid particles of the air, which, as I observed before, either weakened or otherwise altered alkaline

salts and substances; or perhaps, by taking it himself thick and turbid, and ordering others so to do, he intended that any acids which might too much abound in the first passages, should by the earthy parts of the quick-lime be absorbed and obtunded, and consequently the action of the alkaline salts and substances be less impeded.

“ He confidently recommended this
 “ medicine in gravelly cases, it not
 “ having failed in any one case, that
 “ he knew of; but in case of a stone
 “ in the bladder, he acknowledged that
 “ the success was by no means equally
 “ certain; but he believed this at least
 “ might be depended on, that while a
 “ patient takes this lixivium in due
 G 3 “ quantity,

“ quantity, the stone will never grow
“ bigger, and no new ones will be ge-
“ nerated.

“ And so positive was he of the
“ service it would be to mankind, that
“ he desired to be remembered, after
“ death, for nothing more than the
“ share he had in introducing the
“ practice of inoculation and this lixi-
“ vium.”

Although the doctor was not the first who made use of the soap-lye for the gravel and stone, yet as he was, for aught that appears to the contrary, the author of the practice of giving it in such large quantities, the merit of this improvement justly belongs to him ;

him ; and therefore his name ought to be had in grateful remembrance.

As to what farther relates to this subject, the regimen that he observed whilst he was taking the lye, the observations that he made from time to time on its effects upon himself, and the inferences deduced from them, I refer to “ The abstract of his own
 “ case, written by himself, as far as
 “ relates to the taking of this lixivium
 “ for the stone and gravel, and printed
 “ only for the better instruction and
 “ direction of those who take that medicine,” from which, what I have thus related, is transcribed.

The ingenious and learned Dr. WHYTT, professor of medicine in the university of Edinburgh, in his Essay on the Virtues of Lime-water and Soap in the Cure of the Stone, declares it to be his opinion, that the lithonthriptic virtue of soap is chiefly in the quick-lime, which, together with alkaline fixed salts and oil, constitutes the whole of that composition.

He, it seems, was first led into this persuasion after reading the ingenious experiments published by Dr. HALES, in the year 1741, upon Mrs. STEPHENS's medicines; as it there appears that the soap owes its virtue neither to pot-ash nor oil, but wholly to quick-lime; and

as

as that bears so small a proportion to the other ingredients, he thought it reasonable to expect greatest benefits from large quantities of lime-water assisted by soap.

He was afterwards confirmed in this opinion by the speedy and good effects of lime-water in the case of Mr. DAVID MILLAR, who, after he had taken soap five months without any sensible relief, upon drinking, by his advice, large quantities of lime-water along with it, in a few days was freed from many of the troublesome, painful, and dangerous complaints, he before laboured under; and by persisting in this course four months longer, after voiding two pretty large fragments of
a stone

a stone, he continued from the beginning of the year 1742 (when the doctor's Essay was first written) to June 1751, (when he died) perfectly free from all symptoms of the stone, without taking medicines of any kind.

The doctor consequently thinks, that there can be no doubt but that the stone which gave him so much uneasiness was wholly brought away by drinking daily for that space of time three pints of lime-water along with an ounce and half of soap.

This was, indeed, a very striking case, and most certainly justified the inference he at that time deduced from it. But this is the only instance he
has

has given of such sudden relief and perfect deliverance obtained from lime-water assisted by soap ; whereas subsequent experience has sufficiently evinced the more salutary power of soap-lye, as in many instances it has given very quick relief, not only unassisted by lime-water and soap, but even after they have been taken in large quantities for a long time without effect. A few cases of this kind have occurred to me ; and many more are so well known and attested by others, that it is needless to exemplify them, at least at present.

I am therefore, by irresistible conviction, obliged to differ from the doctor in this point ; and indeed he has himself

self contributed much towards this dissent. For, among the numerous experiments he has made and communicated to prove the superior efficacy of lime-water, both to soap, and to alkaline fixed salts, as a dissolvent of hard calculus concretions immersed in it, there are several which plainly demonstrate the superior power of soap-lye *.

As he ascribes the dissolving quality of such substances, when given inwardly, to their superior efficacy as menstruums; therefore soap-lye, even from his own supposition, is more to be relied on as a medicine.

* See his Experiments, edit. 3. p. 92, 93, 94, 95, and 96.

And

And if at the same time the following experiments are added; the evident prevalence of soap-lye as a dissolving menstruum will be still farther confirmed.

Let it be recollected, that, by Dr. JURIN's experiment, such a small quantity of soap-lye as a tea-spoonful, mixed in two table-spoonfuls of river-water, was found to dissolve a rugged red stone of the size of a small pea, without the assistance of heat, in the space of two days. My own experiments are the following.

1. I put a fragment of a hard compact calculus, weighing eight grains,
into

into an ounce of recently and well-cal-cined salt of tartar, and afterwards poured three ounces of boiling rain-water upon them, and allowed them to infuse in a moderate heat before the fire, in a four-ounce gally-pot covered with paper; after they had thus remained twenty-four hours, on examining, I found not the least sign of any solution.

2. I repeated this experiment with a fragment of the same calculus, weighing ten grains, and one ounce of recently and well-cal-cined oyfter-shell quick-lime; and after twenty-four hours infusion found no solution; only it became a little slippery to the touch, and the brownish colour of
of

of the calculus was become somewhat whiter.

3. I put in the same manner a fragment of the same calculus, weighing nine grains, into salt of tartar and quick-lime, of each half an ounce, with the same quantity of water; and in ten hours infusion found it totally dissolved.

4. I repeated the experiment with a fragment of the same calculus, weighing fourteen grains, in six drachms of quick-lime, and three drachms of salt of tartar; and after an infusion of twenty-four hours, I found it so far dissolved, that only about half a grain remained.

5. A

5. A fragment of the same calculus, weighing fourteen grains, in six drachms of salt of tartar, and three drachms of quick-lime, after an infusion of twelve hours, was found totally dissolved.

6. I made an experiment, by immersing a fragment of the same calculus, weighing five grains, in four ounces of boiling lime-water; and after an infusion of twenty-four hours, found that it lost none of its weight, but only became of a lighter colour.

This lime-water was prepared by pouring a pint of boiling rain-water
upon

upon four ounces of oyſter-ſhell quick-lime.

7: I put a fragment of the ſame calculus, weighing ten grains, into fix ounces of a cold ſolution of Ruſſian pot-aſh, obtained by letting it run in a moiſt air; and after three days infuſion, found not the leaſt ſolution, nor even its colour changed.

From theſe experiments it is apparent, that ſuch a ſudden ſolution of calculous concretions is only obtained by the combination of alkaline fixed ſalts and quick-lime; that ſeparately they are very far from having ſuch a ſpeedy effect; and that conſequently ſoap-lye is the preferable menſtrum.

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The

The doctor's experiments, it is true, have proved a very considerable dissolving quality in lime-water, and shewn that calcined oyster or cockle-shells afford a better lime for that purpose than lime-stone: this, however, I think, proceeds not from any inherent quality in the shells themselves, but from their texture being not so compact and firm as that of stone, and consequently not only more easy to be thoroughly calcined, but likewise more ready, and apt, to receive, and retain, a greater quantity of igneous particles, to which alone, in my opinion, their dissolving qualities are to be ascribed.

Lixivial

Lixivial fixed salts and quick-lime are in many respects similar alkaline substances, being both the offspring of fire ; but it is very remarkable, that, by mixing them together, a much more intense degree of alkaline acrimony, as has been already mentioned, is produced, than either of them is separately possessed of. To this increased acrimony, as the doctor himself by the above-mentioned experiments has proved, it must be ascribed, that a more speedy solution of calculous substances is effected : and as by these experiments he has evidently demonstrated, that soap-lye is endued with a dissolving quality much superior either to lime-water or soap, I am greatly

surpized that he should totally exclude alkaline fixed salts, since an equal quantity of them and quick-lime dissolved in water constitute soap-lye*, from having any share in the dissolving virtue of soap; and the more, as even he himself, by one of his experiments, has conceded some degree at least, of a lithonthriptic quality even to a weak solution of pot-ash in water. And when it is considered, that, by his own confession, the quantity of these salts greatly exceeds that of quick-lime in the composition of soap, even so far, that it is doubted whether there is any lime at all in Alicant soap, which alone is ordered for in-

* London Dispensatory.

ternal use *; and that I have proved, by experiment 5, a more speedy solution of calculous substances to be obtained by their immersion, in a mixture in which the alkaline fixed salts exceed the quick-lime by one third, this exclusion seems the more extraordinary.

A lady of great distinction told me, that she was informed by a lady in Ireland, of high rank, and her acquaintance, that the Rev. Mr. WELSH, a country clergyman in that kingdom, had often practised, with great success, upon the gravel and stone, by giving in a pint of veal-broth twice a day, two hours before breakfast, and when

* Dr. ALSTON's Dissertation on Quick-lime. p. 19.

going to bed, a tea-spoonful and a half of a strong lixivium or lye, made only with Russia or Flanders ashes, if to be got; if not, with the ashes of sea-wreck or weed, by putting them into a sufficient quantity of boiling water; and after they had boiled some time, letting them remain in the vessel till the ashes subsided, and after that pouring off the clear lye for use, which, he says, ought to be as strong as possible. If the complaint is bad, he directs that the same quantity of the lye should be taken, in like manner, before dinner; and that the patients, while taking this medicine, should sup upon broth, and at dinner drink only rum and water very weak, and avoid

avoid every sort of food which has any acid or salt in it.

From this observation, I think it reasonable to conclude, that the lithon-thriptic virtue of alkaline fixed salts, even without the assistance of quick-lime, is apparent; and consequently their exclusion less defensible.

As to oil, the third and by much the largest ingredient in the composition of soap, it is so far from having any share in its lithonthriptic properties, that on the contrary I think it rather tends to counteract those of the other two; which, if the expression be allowable, may be looked upon as a solid soap-lye, by becoming in some

H 4

degree,

degree, a cement to connect the calcareous particles of our food, which, subsiding, constitute the most considerable share in such concretions as are found in the secretory and excretory organs of the urinous evacuation.

That this is the case, will evidently appear by the easy experiment of calcining a bone till it is reduced to an inert unactive earth ; which, if not disturbed, will, nevertheless, retain its former shape ; an indication surely, that the quantity of earth is much greater than of all the other substances which constitute the fabrick of the bones. The bone, thus robbed of its agglutinating principles, will become so friable as to crumble into dust and
ashes

adhes upon a gentle touch ; but by the affusion of a sufficient quantity of oil, such a degree of tenacity may be restored to it, as will allow it to be taken up and handled freely without breaking.

That oil contributes much to the stability of the bones, by preventing them from growing too brittle, the learned and accurate anatomist, doctor ALEXANDER MONRO, when he enumerates the uses of the marrow, has evidently shewn*.

As soap-lye is not incumbered with oil to retard its operation, I think that alone sufficient not only to establish

* Anatomy of the Bones, Edit. iv. p. 20, 21.

it as a more powerful dissolving menstruum, but likewise to recommend it as a more efficacious medicine : and indeed, on the same account, it may with propriety be esteemed a lithon-thriptic *solutis principiis*, a phrase made use of by the learned Dr. HUXHAM, when preferring the antimonial wine to all the other preparations of antimony*.

But this is not the only advantage possessed by soap-lye in preference to soap, and indeed to all the alkaline tribe hitherto known. For the reason above assigned, a much less quantity will be sufficient, which, therefore, may be diluted with a proper

* Observations upon Antimony, p. 67.

quantity of any bland vehicle, to prevent the painful irritation in swallowing it; and thus the nauseous and disagreeable tastes so common to such substances will be less perceptible; whereas soap, either in a liquid or solid form, must be taken in such large quantities before any benefit can be expected from it, as will in time, even to the most resolute, prove very disgusting, if not otherwise noxious; for oil, by such long boiling as is necessary to make it coalesce with the other ingredients, and be converted into soap, must become very rancid and acrid, and therefore on many accounts extremely hurtful.

For

For a farther illustration of the ill consequences, which may ensue from the existence of too great a quantity of rancid oil in the constitution, from whatsoever cause it happens, I again refer to what Dr. MONRO has said upon this subject, in the place before cited.

Having thus sufficiently proved that soap-lye, whether considered as a menstruum or medicine, has a power of dissolution superior to that of lime-water and soap, either conjunctively, or separately; and at the same time considering that many persons who had taken large quantities of soap and lime-water, not only for months but
years

years without benefit, yet afterwards, upon taking soap-lye, were quickly relieved from several troublesome complaints, of which some instances will be taken notice of in the sequel of this disquisition; and that though much stress is laid upon lime-water, yet it must be remembered, that Mr. MILLAR, from May to the latter end of September, took above seven pounds weight of soap before he began to take lime-water with it, and continued to take one ounce and a half of soap daily afterwards; I think it reasonable to conclude, that the soap was preparative and very conducive to the subsequent good effects observed in this gentleman's case, and this conclusion is confirmed even by the doc-

tor himself, who gives one remarkable instance of a stone in the bladder completely dissolved by soap alone, in the case of the Rev. Mr. MATTHEW SIMSON*.

In the last case recited by doctor WHYTT, soap was found so necessary, that the painful symptoms returned when the soap was omitted, though the lime-water was continued; and the doctor was obliged to confess, that some stones yielded to soap, which could not be diminished by lime-water. But as none of my experiments have furnished any example of a stone which soap-lees did not speedily dissolve; from these considerations, I can-

* Essay, p. 190.

not avoid giving the preference to soap-lye, not only as a more powerful, but likewise as a more pleasant, and, if prudently managed, safe lithonthriptic.

As this learned gentleman, however, from a principle, undoubtedly, of universal benevolence, has taken great pains to give instructions and directions to those who are obliged to take such substances, and to shew what regimen they ought to observe, as various incidents occur, and particular circumstances require, he certainly deserves the highest encomiums.

That alkaline fixed salts and substances are possessed of very effectual dissolving qualities, is now so much a prevalent

pravalent opinion, that the practice of giving them for the gravel and stone is become general; and indeed the relief confessedly in many instances obtained has in a great measure established it.

Yet, notwithstanding this, as several forcible objections are started against the use of them, it will be necessary, at least in some measure, to obviate them before I proceed.

It is objected, that the large quantities of such acrid medicines as are ordered, and are indeed necessary to effect the solution of such concretions as are formed in the kidneys and bladder, especically after they are become
large

large and hard, must in time be productive, if not of all the ill consequences, at least of some, enumerated by BOERHAAVE, Aphorisms 85 and 86, as the effect of an alkaline acrimony*.

That the excess of an alkaline acrimony in the constitution will be productive of bad consequences, it is very reasonable to expect; yet from experience in many instances it is found, that those who have taken large quantities of alkaline substances for the gravel and stone, are so far from being injured thereby, that, on the contrary, they were by the use of them great-

* See the most learned physician baron VAN SWIETEN's commentaries upon these aphorisms.

ly relieved from other complaints which they before were subject to.

In particular, Dr. WHYTT has taken notice of this, in several of the cases he has related, among which that of the late Lord WALPOLE is the principal; who, from July 1748, to the beginning of 1757, drank three English pints of lime-water, and swallowed for the most part an ounce of soap, daily, except for two months or thereabout, during which time he took only one pint of lime-water, and one third part of an ounce of soap, daily; by which means he was not only relieved from the painful symptoms of the stone, but had his health greatly improved in other respects; his
appetite,

appetite, healthful look, and a degree of spirits uncommon to his age (he was then in his 78th year), continued till the end of 1756, when his last illness began first to attack him, which was a lingering feverish disorder, very much affecting his spirits, but entirely unconnected with the stone: and when opened after death, which happened a few months afterwards, all the viscera which were immediately concerned in the secretion and excretion of urine, were found in a natural healthy state, except that the coats of the bladder appeared to be a little thicker than common, and three small stones were found, two loose in the bladder, and a very small one sticking in the passage; all the other viscera

in the abdomen (the breast and heart not being opened) were found likewise found, except the gall-bladder, which was full of stones, an indication that alkaline substances are more particularly adapted for dissolving such concretions as exist in the urinary organs than in the gall-bladder ; which Dr. WHYTT is not surprized at, as he observed that soap and lime-water, which dissolve the former out of the body, yet do not make the smallest impression upon the latter.

Another remarkable observation to this purpose is related by the learned Dr. DE HAEN, professor of medicine at Vienna *, in the case of a shoe-

* Ratio Medendi, edit. Lugd. Bat. 1761. p. 137, 138.

maker,

maker, who, if ever any, for the space of seven years, was a martyr to the stone in the bladder, and who, upon that account, being admitted into the hospital, took, from the month of November 1756, to June 1757, seventeen pounds weight of soap, and 1500 pounds of lime-water, with as much milk.

In three or four months after he began this course, he found himself as easy as any person who never was troubled with the stone; passed his urine as readily, and had afterwards no stranguery, no retention, no heat, no pain, and was able to retain it the usual time as healthy people do; and though, when dismissed the hospital, he forbore

the use of these medicines, and lived at large, eating plentifully salt and acrid food which he was fond of, yet, notwithstanding, about four or five months afterwards, it was found that he had no returns of his former complaints, and he otherwise continued in perfect good health, although, upon searching, the stone was still found remaining in his bladder.

Yet to this relation the doctor adds, *From the use of such a quantity of alkaline substances, may not a putrid solution of the humours ensue?* Doctor WHYTT, and others, never observed that consequence, nor did he himself find any thing like it happen to his patient; so far otherwise, that from a
bad

bad habit of body he became quite sound, and so plethoric that it was necessary on that account to bleed him; and the doctor demonstrated to a full audience, that his blood was in every respect exceedingly good.

The doctor the year after (p. 203, 204.) repeats the observation, and says, that even then this man continued in good health, eating and drinking indiscriminately what he liked best. He caused him again to be brought to the hospital, where he acknowledged that he was so free from every complaint, that he did not know he was troubled with the stone; yet to every one who searched him, its existence was very perceptible.

I am, therefore, not at all surprized, that persons who are subject to calculous concretions find no inconvenience from taking such large quantities of these substances, as they are generally observed to have either naturally, or from their manner of living, and other circumstances, lax and weak solids. May not their fluids, by not being sufficiently acted upon, become viscid, and consequently pernaturally concrecent? If so, it is reasonable to conclude, that by such substances as greatly stimulate the solids, and are also endued with a peculiar attenuating quality, the fluids, in consequence of such irritation, will be increased in their motion, and thereby

by coagulations and concretions prevented; and also that, by being thus attenuated, the usual and necessary evacuations will be increased, and consequently the redundancy of pituitous-viscid humours, which otherwise in many respects injure health, will be lessened; it is, therefore, not wonderful that, in nephritic complaints, patients should not only find ease, but likewise, by being disincumbered from a load of tenacious glutinous humours, be relieved from other diseases, which they were formerly subject to; for it is a general remark, that persons, who take large quantities of alkaline fixed salts and substances for the gravel and stone, and observe strictly the regimen prescribed to them, become lean.

As

As to the nature and properties of alkaline fixed salts, and their good effects in such diseases as are owing to relaxed weak solids, and redundant viscid fluids, if taken in small quantities well diluted, and continued a proper time, consult BOERHAAVE *.

From hence it is apparent that the internal use of such substances, if properly and cautiously administered, is not attended with such formidable consequences as might be expected; and, therefore, I think the chief objection is, in a great measure, obviated.

* Operationes Chem. Processus 12.

As it has, however, been often observed, that persons who had taken very large quantities of these substances for a great length of time were yet so far from having been cured, that, when opened after death, stones were found still remaining in their bladders; hence another objection occurs, that they are evidently insufficient for effecting the ends proposed.

To which I answer; that, when the solution of these concretions is not attempted till they are grown large, compact, hard, and smooth, this may be often the case. Yet to many persons, who, even in these circumstances,

stances, have taken such substances, the relief thereby obtained has been so remarkable, that they afterwards continued many years as easy as if they had no stone, and at last died in an advanced age of other diseases, which had not the least connection with their former nephritic complaints. Thus, I think, the objection can have but little weight; it being a maxim with regard to painful diseases, that, if a perfect cure cannot be obtained, we should, at least, endeavour to give ease, and that palliating medicines are better than none.

It is to be considered that such large concretions, as are found in the bladder, owe their existence to a very
 small

small hard substance, commonly termed the nucleus, transmitted thither, for the most part, from the kidneys, and increase to such a large size as they are often observed to attain, not all at once, but by this nucleus being circumvested from time to time with fresh supplies of calculous matter ; so that thus a substance is formed consisting of several strata or concentric layers, somewhat like the coats of an onion.

As these different layers, however, continue after their formation for a considerable time rough, this is the period in which the fits of the stone are most severely felt, occasioned by their rough surfaces, irritating and lacerating

cerating the very sensible and tender internal coat of the bladder ; but when once they are become smooth, either by the action of the bladder, or otherwise, this painful irritation ceases ; and while they thus continue, the sensation afterwards is only that of weight, nay, not always even that ; for in the cases above related, those persons, notwithstanding that the existence of the stone was evident, continued as easy as if they had none.

And, to confirm this, Dr. DE HAEN * observes, that there are innumerable examples, where, by the assistance of provident nature, without the intervention of art, and by opera-

* Ratio Medendi, p. 208, 209.

tions unknown to us, such a degree of ease has been obtained in calculous disorders, that in the few following remarkable instances, which he has selected and transcribed from other writers, not one of the persons there mentioned was ever sensible of having had such complaints.

“ A man, during his life, except
 “ the two last days, continued abso-
 “ lutely free from all nephritic com-
 “ plaints; yet, when dissected, his left
 “ kidney was found consumed to a
 “ putrid sanies, and his right ureter
 “ totally obstructed with a stone*.

* Holler. cap. Hydrope in Scholio.

“ Two men never once complain-
 “ ed of any disorder in their kidneys ;
 “ yet after death, a very large stone
 “ was found in the kidney of each of
 “ them *.

“ HERMAN OSTERDYKE SCHACHT,
 “ (*professor of medicine at Leyden,*
 “ *contemporary and colleague with BOER-*
 “ *HAAVE*) being an eye-witness, has
 “ recorded, that a man had a stone
 “ of four ounces weight in the ureter,
 “ and, besides that, another of seven
 “ ounces weight in the bladder ; yet
 “ from neither of these had he the least
 “ pain or trouble †.

* Bagliv. Prax. Med. lib. i. cap. 9.

† Oratione Leydæ habita, 8 Feb. 1735.

“ HEUR-

“ HEURNIUS* by dissection extract-
 “ ed seventy from one, and eighty
 “ small stones from the other kidney
 “ of a man who never had any ne-
 “ phritic complaints.

“ A nobleman, without the least in-
 “ dication of its existence, had a stone
 “ in the bladder, not only remark-
 “ able for its being extremely hard,
 “ and weighing fourteen ounces, but
 “ for being perforated its whole length,
 “ so as to form as it were a canal,
 “ through which his urine flowed,
 “ without the least impediment, or in-
 “ terruption †.”

* Fernel. Op. edit. Leyd. p. 2. lib. vi.

† Fredericus Loffius, lib. iii. Obs. N° 53.

An eye-witness relates, “ That two
 “ large stones, weighing six ounces,
 “ were found in both kidneys of a
 “ privy-counsellor of his Imperial Ma-
 “ jesty, without the least preceding
 “ indication of any such thing, in what
 “ view soever considered. He passed
 “ no gravel, had not the least numb-
 “ ness in his legs, nor pain in his loins;
 “ and, as to his urine, so far was it
 “ from being in the least obstructed,
 “ that he voided it in too large quan-
 “ tities, but quite limpid and pale,
 “ like common water; from which
 “ circumstance his thirst became so
 “ intolerable that no drink could af-
 “ suage it *.”

* Antonius de Pozzis apud Bonetum Med. Sep. tom.
 i. lib. iii. sect. 25, cap. 6.

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I therefore think, that the alternate accession and remission of pain in this dreadful distemper, abstractedly considered, without regard to other, too often concomitant, complaints, is only to be accounted for from the smoothness or roughness of those calculous substances contained in the bladder; and hence appears the expediency of giving such medicines as will prevent any future accretions. From the preceding remarks, it is likewise apparent, that a solution of alkaline fixed salts and quick-lime combined (or soap-lye) is found, not only most efficaciously, but likewise speedily to answer this purpose, if conveyed in sufficient quantities to the parts affected;

ted; and that it is so conveyed, appears from experiment; for the urine of those persons who have taken large quantities of these substances for a length of time, becomes a very powerful dissolving menstruum of calculous substances immersed in it.

Upon the whole, I am firmly persuaded, that, if patients were provident enough to be attentive to the first approaches of this cruel disorder, and to pursue proper measures to prevent its increase, by taking small quantities of lixivial salts and substances, of which I, at present, know none so good and effectual as soap-lye, in large quantities of soft emollient diluting liquors, observing a proper regimen,

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and repeating this course occasionally as symptoms indicate, the future existence of such large and hard concretions would be entirely prevented.

And, indeed, of all the lasting disorders which affect mankind, there are none, in my opinion, to which the following advice is more applicable than to this :

“ Principiis obsta, fero medicina paratur,

“ Cum mala per longas invaluere moras.

“ Sed propera ; nec te venturas differ in horas ;

“ Qui non est hodie, cras minus aptus erit.”

OVID Remed. Amor. ver. 91, &c.

This advice, I presume, will not be objected to by any, nor the expediency denied of administering in time such medicines as from experience are

found most serviceable to prevent the formation, or, if already formed, to promote the solution, of calculous concretions; or such as give ease and prevent their increase, if, by the neglect of attempting it sooner, these substances are become so large and hard that this solution cannot be effected.

And as I know none more efficacious to all these purposes than soap-lye, I therefore recommend that species of it which is prepared with two third parts of a pure alkaline fixed salt, and one of well-calcined quicklime dissolved in a sufficient quantity of water; for, by experiment 6th, I found a lye with this proportion of these substances, the most speedy
dissolvent

dissolvent of the fragment of a calculus immersed in it ; and this is the exact proportion of these substances in the soap-lye made use of with great success for some years, by Dr. GUSTHART, an eminent physician at Bath, in a prescription communicated to me by a friend of the doctor's, which is as follows :

Take eight ounces of pot-ash and four ounces of quick-lime fresh from the kiln ; mix and put them into a glazed earthen vessel ; then pour upon them a quart of boiling soft spring-water : let the infusion remain twenty-four hours, stirring it now and then ; and afterwards filtrate it for use.

The soap-lye that I have made, and used likewise with success, for some time past, as to the proportion of the ingredients and quantity of water, is exactly the same with the above. But as BOERHAAVE has observed, that an alkaline fixed salt is from no substance whatever sooner and better obtained than from tartar of wine, and to this observation has added that PARACELSUS and HELMONT have esteemed a salt thus prepared, to be the prince of alkalies*; instead of pot-ash, I have substituted salt of tartar, and, if used immediately after it is well calcined, the degree of alkaline acrimony or strength of a lye prepared with it, will be very

* Elementa Chem. tom. ii. p. 53.

exactly

exactly ascertained: whereas all the different sorts of pot-ash are brought to us in large quantities, in casks, from different regions; so that, by being long kept, and often exposed to the air, as I before took notice, they will become weaker, and otherwise altered from what they were at first; on which account, the degree of strength of a lye made with them cannot be so easily determined, and consequently its lithontriptic qualities not so much depended on.

As oyster-shell quick-lime, calcined till it is uniformly and thoroughly white, is by Dr. WHYTT's experiments found to be a more efficacious dissolvent, as a menstruum, than the common

mon quick-lime ; I have therefore substituted the former, in the lye that I have made, instead of the latter.

It is however objected to these medicines, that many times bad consequences have been observed to ensue from the long-continued use of them ; to which I answer, that this can only happen from their being taken either at improper times, or in too large quantities, which is often the case, as many people, in the calamitous circumstances which arise from the existence of a stone in the bladder, are in greater haste to be well, than the nature of their disorders will admit of ; and the faults are imputed to the
 medicine,

medicine, which are intirely owing to their own indiscretion. If this medicine is prudently administered, I am convinced that no bad effects will follow.

For the due administration, therefore, of such substances, I shall subjoin the following remarks.

1st, If the disease is recent, and there is nothing but loose gravel, or if its concretions are but small, small quantities of these medicines, such as 30 or 40 drops two or three times a day, in half a pint of weak veal-broth, or any other soft mucilaginous vehicle, will be sufficient to comminute and expel what shall be already
ready

ready concreted, and prevent further concretions. This course ought, however, to be persisted in, not only till the patient is perfectly easy, but so long as there is the least appearance of fabulous matter subsiding in the urine, or even so long as it continues to fur the chamber-pot. And as many people are naturally apt to breed gravel, this course ought to be renewed from time to time, as succeeding symptoms of its existence indicate.

2dly, If, after a severe nephritic fit, there is reason to suspect, that a small calculus is transmitted from the kidneys to the bladder, a large quantity may be given, in order to promote its solution and expulsion as soon as possible.

fible. A tea-spoonful, or even two, twice or thrice a day, cannot, I think, be too much; the dose, however, as I before observed, ought to be regulated, and made either less or more, according to its effects.

By this prudent management, I know a person who by degrees was enabled to take an ounce of a very strong soap-lye every day for a great length of time, with good effect as to the complaint for which he took it, and not the least ill consequence with regard to his health in other respects.

3dly, If, through neglect, as I said before, or improper and ineffectual medicines,

medicines, calculous concretions are become so large, compact, and hard, that a total solution of them cannot be effected, our business then is to augment the dose of these substances by slow degrees, carefully attending to the effects of each preceding quantity before we proceed to a farther augmentation; by which means I do not in the least doubt, that not only new accretions, or layers, will be prevented, but likewise the rough surfaces of those already formed, speedily rendered smooth; hence, a permanency of ease will be obtained, which persons in these circumstances were before unacquainted with.

4thly, In that state of the disease where a stone in passing from the kidneys is impacted, and firmly adheres, in the narrow passages leading from thence to the bladder, occasioning excruciating pains in the loins, and pains in the lower belly like colic pains, with bilious vomitings, obstinate constiveness, strangury, tenesmus, &c. alkaline salts, and all other irritating medicines, ought carefully to be avoided; and lithontriptic substances in all the more severe fits of this distemper should be forborn till they are abated, nay, even afterwards discontinued for some time, upon the recurring of very painful paroxysms; as, by irritatinng too much at these particular

ticular times, painful strictures, ruptures of blood-vessels, and inflammations, may be brought on.

5thly, In administering these medicines, with respect to the quantity proper to be given, great regard ought to be had to the different constitutions of the patients. To lax habits, fat and phlegmatic, more ; to others, less : to those in whose fluids pituitous viscid humours abound, more ; but where bile is predominant, less. Different degrees of sensibility ought also to be attended to ; for those who upon taking such substances are not affected to a great degree with painful irritation, must, in order to obtain the ends proposed, take them in large quantities,

ties ; whereas those, to whom they are productive of extreme painful sensations, should take them in small quantities, and continue the use of them for a great length of time ; and therefore, the milder alkaline preparations, such as soap and lime-water, may be more convenient.

6thly, There are others, who, from an unaccountable antipathy in their natures to particular things, cannot bear even the smallest quantities of those alkaline acrid substances ; with those, therefore, other methods must be tried, and such medicines given as have, from repeated experience, been found remarkably serviceable in such complaints ; for the choice of

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which I can only at present refer them to practical writers.

I should have now proceeded to communicate such farther remarks relative to this subject as have occurred to me from my own observation, and the credible information of others; but as a very bad state of health, and other necessary avocations, have prevented me from finishing even this small treatise in the time and manner I at first intended, and as I am greatly importuned not to withhold any longer my remarks from the public, to which some are pleased to say my little treatise will be of great use; I have thought proper to comply with that request, and promise, with all

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convenient speed, to publish what farther I know, or what shall be communicated to me by others, concerning this subject.

The second part will chiefly consist of remarks on the nature and properties of alkaline fixed salts and substances; on indications necessary to be attended to in the different periods of this disease; the various symptoms concomitant to each particular paroxysm; the management of patients according to their different ages, constitutions, peculiar habits and customs; and lastly, the helps necessary to be made use of for the relief of the troublesome, painful, and dangerous complaints of persons who cannot take

alkaline falts and fubftances, and at thofe times when even other acrid and ftrongly ftimulating diuretic medicines are not only improper, but may be attended with ill confequences.

And this I fhall do with the more chearfulness, as I hope thereby to dif-abufe mankind, and prevent perfons from fubmitting to the illiberal treatment they often meet with from retailers of fecrets.

THUS far I had proceeded by medical conjecture and chymical investigation, when, after the greateft part of this treatife was printed, I had

an opportunity of making inquiry, and of ascertaining by testimony what I had before only advanced from probable deduction.

The medicine which Dr. CHITTICK administers, he does not deny that he inherits from his brother; it was given, according to an account sent me from Ireland, by General DUNBAR; I have received the genuine receipt in these words :

“ Take one tea-spoonful of the
 “ strongest soap-lye, mixed in two table-
 “ spoonfuls of sweet milk, an hour
 “ before breakfast, and at going to bed.
 “ Before you take the medicine, take
 “ a sup of pure milk; and immediately

“ after you have swallowed the medicine, take another.

“ If you find this agrees with you
 “ for two or three days, you may add
 “ half as much more to the dose.”

This agrees exactly with such information as had been given me before, by another hand.

Having now brought this valuable secret to light, and put into the hands of the low as well as of the high that medicine which I believe to be of the greatest efficacy against the most painful of all diseases, I sit down with the pleasing reflection, that I have contributed something to human happiness.

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A
DISQUISITION
ON
MEDICINES
THAT DISSOLVE

The GRAVEL and STONE.

PART II.

IN the former part of this treatise, which was published in the year 1766, I promised to communicate, with all convenient speed, such further remarks, relative to the subject, as had occurred to me from my own ob-

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servation, and the credible information of others.

But as the same causes which prevented me from finishing that treatise in the manner I first intended, do still exist, under the additional disadvantage of greatly increased infirmities : I hope they will be my apology for not having sooner performed this promise, and for the brevity and imperfection with which it is performed.

I shall, in the best manner I can, consider,

1. In what quantities soap-lye may be given with safety, and a reasonable prospect of success in the different
states

states or periods, and under the various circumstances and symptoms, of patients who suffer from calculous concretions in the kidneys and bladder or their excretory ducts.

2. What methods ought to be made use of for alleviating the painful and dangerous symptoms which may occur in the course of this distemper, when not only soap-lye, but all other strongly stimulating medicines are improper and dangerous to those persons who, at other times, might take them not only with safety but advantage :

The different states or periods that ought to be particularly adverted to in this distemper, are the following,

1. The

1. The existence of concreted sand or gravel, but in particles so minute, as to be easily, and even imperceptibly, voided, by the assistance of nature without the concurrence of art.

2. The existence of concretions of such a size as may be voided by the efforts of nature, without the assistance of art, but not without pain and other troublesome symptoms.

3. The existence of concretions of such a size as are not to be expelled without the assistance of art, but not so large as to require comminution before their expulsion can be effected.

4. The

4. The existence of concretions of such a size as require comminution and dissolution before they can be excreted.

The voiding by urine, particles of red sand or gravel, is a symptom supposed to be an evident indication of the commencement of the first period of this distemper.

But as I have known several persons void such substances in large quantities, for many years, without the least inconvenience or subsequent ill effects; I am of opinion that these concretions are not of the calculous kind.

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When inspected by the assistance of the microscope, they are found to be a congeries of exceedingly small transparent substances, like so many gems resembling garnets : I am therefore of opinion, that their existence is to be ascribed to the attraction and crystallization of the salts of the urine ; and that without other occurring causes they are not apt to be concreted into larger substances.

While such substances continue to be voided, it is remarkable that there is often found firmly adhering to the bottom and sides of the vessel, in which the urine is contained, a beautiful red coloured sediment ; this no doubt

doubt is occasioned by the precipitation of those salts after evacuation, before they have had time to be concreted into crystals; for it is observable that this is a frequent appearance in acute diseases, especially such as are of the intermitting kind, without any previous or subsequent signs of gravel.

And it is farther remarkable, that to those persons who are of a sanguine constitution, and have strong and elastic solids, the voiding of such substances is a very common event; and that while they continue in the same state, they are very seldom, if at all, subject to the gravel; it being a general observation, that those who are subject to this complaint have, either naturally,
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or from their manner of living, and other circumstances, weak and lax solids, on which account their fluids, not being sufficiently acted upon, will be loaded with a cold ropy phlegm, and consequently liable to stagnations and preternatural concretions.

It is indeed a general observation, that those who only void red gravel never have the stone; and this observation may very probably be founded upon universal experience, for the reasons I have just assigned.

But it is my opinion, that the excretion of small, opaque and brown coloured grit, or gravel, is a certain sign of the accession of the first period
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of this distemper ; while this substance is voided, a rough fabulous matter is deposited on the bottom and sides of the vessel, so tenacious as not to be easily rubbed off, of the same colour and substance as the gravel, but not concreted.

The opacity of these concretions is a sign that they abound with earthy particles, and their tenacity proves that they are plentifully supplied with a connecting medium.

It, however, frequently happens that by the assistance of provident nature, the symptoms which might be reasonably expected, in consequence of voiding such substances, do not ensue.

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I have myself known several persons who have frequently voided large quantities of such substances, for many years, without the least pain or trouble, and who therefore have not been easily persuaded that future inconveniences were to be apprehended.

To persons in these circumstances, indeed, stimulating medicines should not hastily be administered ; for, by an untimely officiousness, many painful and troublesome symptoms may be brought on, which would not otherwise have happened : but as the salutary operations of nature are often impeded by an improper manner of living, I think it right to admonish them

them of the absolute necessity of observing a strict regimen, with regard to their diet and medicines ; all of which, in order to prevent strictures from painful irritation, ought to consist of such substances, as are mild, cooling, and lubricating ; and on the same account, too frequent and severe exercises ought to be forbidden.

But if, notwithstanding the utmost care and circumpection, such symptoms should come on as indicate danger, the assistance of art becomes necessary.

Those symptoms are frequent returns of severe pains in the back and loins, accompanied with great sickness

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at the stomach, incessant bilious vomitings, constant and painful irritations, and very often unsuccessful efforts to make water.

These are indubitable signs of the existence of concretions, too large to be easily expelled, and consequently that the second period of this distemper has taken place.

It, however, sometimes happens even in this period, that after much pain the concretions are evacuated by the assistance of nature alone.

But, as the trusting altogether to this event, may be attended with great inconvenience, if not danger ; I think
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the interposition of art will be of great service, by concurring with nature, to promote the expulsion of those substances before they become too large to be forced away whole; for by this means the difficult and tedious task of comminuting or dissolving them will be precluded, with all the subsequent dangerous periods of the disease.

In this stage of the disease, therefore, patients ought to observe such a regimen, as will conduce to strengthen their solids, and attenuate their fluids, as it has been already observed, that weak and lax solids, and consequently viscid fluids, have been most commonly the predisposing causes of calculous concretions.

With regard to medicines, those that are moderately diuretic, joined with those that are cooling, relaxing, and anodyne, in order to prevent an excess of painful irritation, ought first to be tried.

But if such medicines prove insufficient for effecting the expulsion, those that are more stimulating and diuretic, and even the acrid alkaline fixed salts and substances, may be given with advantage, if concomitant symptoms are not exceptions to their administration.

Among the symptoms which, during their continuance, render it unsafe to administer soap-lye, or any other too strongly

strongly stimulating diuretic medicine, except with the greatest caution, is the voiding of blood with the urine.

This is a frequent event in calculous complaints, and ought principally to be attended to, as it is a certain indication, that the concretions which produce it, are not only too large to be easily excreted, but likewise very hard, rough, and pointed; it is indeed a very dangerous symptom, for if it is not soon removed, it may be the occasion of tedious and perhaps incurable ulcerations of the urinary passages: for by the long continuance of this symptom, the kidneys have sometimes been found almost consumed, or converted into a putrid sanies.

If patients in these circumstances void their urine immediately after an extravasation, the existence of blood in it will be apparent; but if this evacuation should not happen till a considerable time afterwards, the appearance will be different.

For the crassimentum of the blood, by its long continuance in the bladder, will be apt to concrete into substances, either of a fibrous texture, or grumous consistence, whereby it will lose its red, and acquire a dark brown colour; in consequence of which, the urine itself will, in a great measure, assume such a dark coloured aspect, and deposite a sediment exactly resembling coffee grounds,

grounds, without the least appearance of blood in it.

When this symptom supervenes no preparation of the lixivial, alkaline fixed salts and substances should be administered, except in so small a quantity as will not produce violent irritation, or corrected with other medicines that will sufficiently correct their irritating quality.

Under these restrictions I have known soap lye given with advantage even during this symptom, and have been credibly informed, that a gentleman who was grievously afflicted with it for a long time, at length found it restrained by persisting in the use of

soap lye ; at the same time that other symptoms, which undoubtedly indicated the existence of a stone in his bladder, were also in a great measure removed.

It also sometimes happens, that by constant and painful frictions, excited by large and rugged concretions, a great part of that mucus, which is destined by nature for defending the exquisitely sensible internal membranes of the urinary passages from the acrimony of the urine, is abraded, so as to occasion incessant irritations, with painful and too often unsuccessful efforts to make water, whereby such inflammatory strictures of those parts will be induced as may greatly retard, if not totally prevent, the removal of this symptom.

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To persons, in the complicated distress arising from either of these symptoms, my advice is, that such a quantity of blood be immediately taken away as their strength will admit of, in order to empty their vessels, which, by frequent returns of the above symptom, must be too much distended, and on that account more liable to be lacerated and wounded by the illision and friction of the rough surfaces of hard bodies against them.

After this, I think, that without farther delay, soap lye, with proper cautions and restrictions, ought to be administered, as the most efficacious means

means for removing the cause of this complaint.

In order to prevent such an excess of irritation as may be occasioned from the long continued use of such an acrid substance ; I am of opinion that its mildest preparations ought first to be tried, and that even these should be assisted with such other medicines as have been found most serviceable for the alleviation of such symptoms ; at the same time observing such a regimen as is best adapted to strengthen the solids, and attenuate the fluids, with a view to facilitate the extrusion of the offending substances.

The medicines proper to this intention are the mild mucilaginous cooling and anodyne substances, such as mallows, marshmallows, liquorice, sweet almonds, linseed, barley, and other vegetable substances of like nature : those species of gums that are easily and totally dissolvable in water, such as arabic, feneca, tragacanth, and the like : also gelatinous substances, such as decoctions or broths, prepared from the flesh of young animals, as chickens, veal, and lamb : jellies prepared both from animal and vegetable substances, such as shavings of hartshorn and ivory, isinglass, calves-feet, fago, and faloop ; to which may be added, bland oily substances, such as the fresh-drawn oils of
sweet-

sweet-almonds and linseed, spermaceti, and others of like nature.

All these substances, or their various preparations, may be given both as food and medicine, in such quantities and forms as are most agreeable and convenient; with the addition of nitre, if the patients are feverish; and if they are at the same time in great pain from excess of irritation, then anodynes, and even opiats, will become necessary.

With regard to particular forms, commonly prescribed in such cases, I think that they need not be here farther exemplified, as great varieties of them will, no doubt, occur to every person who is but moderately conversant in the
practice

practice of prescribing for calculous complaints.

While bloody urine continues to be voided, the patients should use little or no exercise; for all motion will irritate and endanger new laceration of the parts.

If, after these applications and precautions, the symptom continues, recourse must be had to the different species of the astringents and styptics; as astringents, by constricting and strengthening the vessels, and styptics, by stopping up and conglutinating their open orifices will greatly conduce to suppress it.

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As the Uva-Urſi is evidently a plant of the astringent claſs; I prefer it to all the other ſpecies of that tribe, for this particular purpoſe, as well from my own experience of its uncommon efficacy, as the testimony of many others, who are worthy of the greateſt credit.

In particular the learned Doctor DE HAEN having, in trials frequently repeated, experienced its ſurprizing efficacy for alleviating the ſeverity not only of this ſymptom, but of every other that occurs in the courſe of this deplorable diſeaſe, has declared his opinion, that it will, eſpecially if aſſiſted with opiats, produce the moſt ſalutary

salutary effects in every state and stage of it, however complicated or threatening the circumstances may be, excepting only in cases where lithotomy itself, could not possibly be attended with success *.

The Doctor supposes thirty grains of the powder of the leaves of this plant, given two or three times a day, and continued for a considerable time, to be a sufficient quantity for obtaining all the advantages that can be expected from it.

* Videantur ejus observationes variæ, quæ passim exhibentur super virtutibus hujus plantæ, in affectibus nephriticis et calculosis, in libro *Ratio Medendi* inscripto, et Lugduni Batavorum edito, anno 1761.

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But in my opinion, a double quantity of the powder of this plant may be given, and even this quantity assisted with an infusion, or rather a decoction, of an ounce of the leaves, in the space of twenty-four hours.

If the sanguinary flux, notwithstanding all endeavors to check it, should prove obstinate and profuse, it may be reasonably expected that ulcerations of the urinary organs will be the consequence.

The existence of such ulcerations will be ascertained by the evacuation of pus, and membranous films with the urine, which at the same time will contract a very fetid smell.

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In these circumstances, the above medicines ought to be assisted with the natural balsams, and the milder species of the terebinthinacious resins.

With regard to the natural balsamic substances, the balsam of Capivi, from its remarkable lenient, purgative, and diuretick qualities, will greatly contribute to promote the expulsion of hard and rough calcareous substances; and from its balsamick and vulnerary properties, it is reasonable to expect that it will not only check the flux of blood, but heal the ulcerations that may ensue*.

* Vid. Pharmacopœia Extemporanea, Authore THOMAS FULLER, M. D. sub formulis Mixturæ Balsamicæ et Mixturæ Balsamicæ Nephriticæ.

As to those medicines which are more powerfully restrictive, the Peruvian bark and vitriolick styptics, if administered conjunctly, and at the same time assisted with opiates, will prove the most efficacious for suppressing not only this, but likewise every other sanguine evacuation, from whatever part of the body it proceeds, and by whatever cause it is occasioned.

In order however to suppress that flux of blood, and to cure the ulcerations which it may have produced, I recommend that root which is brought in large quantities from the Brazils under the name of Pareira-Brava, not only because from repeated experience

it is found to be a potent diuretick, but because it is also a very efficacious medicine for attenuating viscid humours *.

I have hitherto considered this sanguine evacuation only as nephritic, arising from the existence of calculous concretions in the kidneys and their excretory ducts ; but if the obstructing substances, by being at last protruded into the bladder, are not quickly and totally voided, they will soon become too large to admit of expulsion ; and in that case a confirmed stone in the bladder, with all its dreadful effects, will be the consequence.

* Vid. Tractatus de Materia Medica, Authore STEPHANO FRANCISCO GEOFFROY, M.D. Tom. II. pag. 21. editus Parisiis, Anno 1741.

But if, from the administration of the above medicines, and others of a like kind, the symptom of voiding blood with the urine should cease, the removal of the cause should be immediately attempted ; and for this purpose, I think the solution of alkaline fixed salts and substances in water, or soap-lye, the most effectual.

I am indeed of the opinion, that, if given in small quantities, and otherwise managed as various symptoms and circumstances require, it will be attended with success even in the worst state of the disease.

However, for rendering them more effectual, a strict regimen ought to be

be observed both with regard to diet and exercise ; as to exercise, even riding on horseback, and in carriages on rough roads, running, and dancing, may be used, if they can be born without exciting too painful irritations.

But all exercise, however gentle, that excites such irritations, should be forborn ; for, as on the one hand the expulsion of calculous concretions will be facilitated ; on the other, dangerous symptoms may be brought on.

If the sanguine evacuation should not yield to the medicines prescribed above, I recommend from 30 to 60 drops of the lixivium, which I have communicated in the former part of

this disquisition to be taken two or three times a day, in half a pint of a mucilaginous apozem, in which the Uva-Urſi and Pareira-Brava are predominant ingredients.

The following decoction, therefore, is a specimens of a medicine well adapted to the purpose in question.

Boil the leaves of the Uva-Urſi, and the roots of the Pareira-Brava, of each ſix drachms, marſhmallow and liquorice roots of each three drachms, gum arabic two drachms, and linſeed one drachm, in three pints of water, until it is reduced to a quart; and let the ſtrained liquor be ſweetened either

with the fyrup of white poppies, or the fyrup of marshmallows.

I make no doubt, if these medicines are given at the distance of two hours, both before and after meals, they will be of the utmost service to promote the suppression of this sanguine flux, especially if assisted from time to time with such a quantity of opiates, as is found necessary either to prevent or remove too frequent and painful irritations.

But it often happens, that such a large quantity of opium, as is found necessary for effecting these purposes, occasions excessive and obstinate costiveness: in that case, those medicines,

which, from experience, are found the most effectual for promoting the evacuation of indurated fæces, must be had recourse to, and repeated occasionally whenever the like necessity requires such an evacuation.

There are, however, many people, with whom opium, even in small doses, will not agree, especially if long continued, but will produce sickness and vomiting; to such patients I would recommend, as a succedaneum, a species of salt prepared from Borax, called *Sal Sedativus*, which I am credibly informed, if given to the quantity of three grains, will produce the like good effects, without the inconvenience.

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Among the symptoms which, during their continuance, require equal caution in the administration of soap-lye, and indeed of every other stimulating diuretick medicine, the following are particularly to be attended to.

In nephritic complaints, if such calculous concretions as are originally formed in the kidneys are large and hard, it frequently happens, that by being protruded from thence they are impacted into, and firmly adhere in the ureters, those exquisitely sensible and very irritable narrow ducts, through which the urine is conveyed from the kidneys to the bladder; so that, from the obstructions thereby

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occasioned, such spasmodic contractions and strictures of those and the neighbouring parts will be excited, as may be productive of most, if not all, of the following symptoms.

Excruciating pains in the back and loins, so exactly resembling those that are occasioned by rheumatic complaints, that unless, preceding and concomitant symptoms are minutely attended to, they are not to be distinguished from them.

The actions, indeed, of flexion and extension may in some measure discriminate them, as those motions are frequently observed to be performed with pain and difficulty in rheumatic

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tic complaints, but not in those that are nephritic.

Such severe pains in the lower belly, as are often mistaken for fits of the colic ; but, by persons who distinguish better, not improperly called the *Stone colic*.

Great sickness at the stomach, attended with such incessant and enormous bilious vomitings, as will prevent the patients from retaining either food or physic.

Obstinate costiveness, which, by being very often accompanied with severe pains in the lower belly, is supposed to be occasioned by an inflammation

mation of the intestines, and too frequently on that account very improperly treated.

Strangury and tenesmus, or frequent and painful irritations, and ineffectual efforts to make water, and go to stool.

These complaints are most commonly the effects of obstructing substances in the ureters, even when they are smooth; but if they happen to be rough and pointed, and are not speedily dislodged, the above symptoms will not only be greatly aggravated, but others that are worse will ensue; as more frequent and more painful irritations and strictures, total retention

tion of urine, more obstinate, and indeed, almost unsurmountable costiveness, more frequent ruptures of large blood vessels, and consequently more profuse evacuations of blood, will follow: all which symptoms, if not speedily remedied, will terminate in inflammations, ulcerations, mortifications, and death.

The impropriety of administering acrid alkaline fixed salts and substances, or even any other strongly stimulating diuretick medicine, to persons in these circumstances, is no less manifest than the utility of pursuing a contrary method, and giving such medicines as are emollient, demulcent, lubricating, relaxing, and anodyne, and consequent-

ly well adapted to facilitate the descent of obstructing substances into the bladder.

To patients, therefore, who are thus afflicted, my advice is, that immediately upon the accession of a severe nephritic fit, they lose such a quantity of blood, as their age and strength will admit; for I have often observed it to produce such a degree of relaxation, that the obstructing substances, by the subsequent efforts of nature, have been so quickly protruded into the bladder, that, from a state of the most excruciating pain, the patient has passed into a state of perfect ease, without any further assistance.

But,

But, if bleeding should not alone be effectual, recourse must be had to such other medicines, as the various symptoms and circumstances require.

Among these, I know none so proper for procuring sudden relief as opium; this generally procures sleep, during which the painful irritations are suspended, and such a relaxation ensues, as may admit the obstructing substances; which, notwithstanding the bleeding, remained in the ureters, to pass into the bladder.

In confirmation of the salutary effects of opium in this disease, it is remarkable, that the famous Dr. HAR-

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VEY, the discoverer of the circulation, freed himself from a very severe nephritic fit, by taking a large quantity of liquid-laudanum ; in consequence of which, he voided very large stones while asleep*.

If in this state of the disease neither bleeding nor opiats succeed, a particular attention should be paid to sickness and bilious vomitings, which are in many respects the efforts of nature to protrude the obstructing substances.

These vomitings, therefore, so far from being immediately restrained, ought to be promoted by large quan-

* Pitcairn, *Elementa Medicinæ*, Cap. de Calculo.

tities of warm, emollient, diluting liquors: by this method a double advantage may be obtained; nature will be assisted in her efforts to protrude the obstructing substance, and the stomach will be freed from a load of bilious, acrid, and viscous humors, and consequently more fit to receive and retain other medicines.

If these vomitings, however, are ineffectual, and yet continue to be severe, they ought to be restrained, as the nearest and most pressing mischief; for which purpose, I know nothing more efficacious than draughts with the salt of wormwood, and juice of lemons, diluted in some stomachick
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vehicle, assisted with opiates, and given while in a state of effervescence.

Obstinate costiveness is too often a concomitant symptom in this state of the disease, which, if not speedily removed, may produce very bad effects; for from the too long continuance of this complaint, the intestines will be so much loaded with hard excrements, that the pressure will prevent the ureters from being dilated sufficiently to allow the obstructing substances which are impacted in them to pass: hence a variety of very painful and dangerous symptoms will ensue.

The

The intestines themselves also being greatly distended, there is reason to fear that the circulation of the blood through them may be impeded to such a degree, as to be productive of mortification ; which is frequently the case in all painful diseases of the lower belly, from whatever cause they proceed, when obstinate costiveness is a symptom.

In these circumstances the indurated excrements are to be evacuated as soon as possible, either by the frequent administration of lubricating and opening clysters ; or, if they should prove insufficient, by purgatives of the lenient kind first, and afterwards, if

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they

they should unfortunately be necessary, by such as act with more force.

But as acrid and drastic purgatives often occasion such an excess of painful irritations, that they either cannot be retained, or, if they are retained by the assistance of opiates, excite inflammatory strictures both in the stomach and intestines.

I therefore, from repeated experience, have recommended an oil that is obtained, either by expression or coction, from the seeds of the *Ricinus Americanus*, or *Palma Christi*, imported in great quantities under the name of Castor oil, from the West Indies, as a more safe medicine. A table spoon-
ful

ful or two given at a time, and repeated occasionally if the complaint is obstinate, seldom fails to answer the purpose of a very efficacious purgative, and acts at the same time as a medicine very well adapted for giving relief in nephritic complaints.

A gentleman, who was for many years most grievously afflicted with frequent returns of very painful nephritic disorders, after trying a great variety of medicines to no purpose, had at last recourse to this oil ; and, by taking a table spoonful or two in the morning fasting, when he had reason to expect the return of a fit, obtained such relief, that he lived very comfortably, without the least dread of

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future

future inconveniencies, till about two months ago, when he died of a sudden disorder.

During the continuance of a nephritic fit, strangury and tenesmus frequently supervene. If the strangury prevails, large quantities of mucilaginous and diuretick apozems, assisted with opiates, should be administered; but if tenesmus is the predominant complaint, then a very small quantity of a decoction of linseed, with a large quantity of opium, should be injected by way of clyster, and retained as long as possible, and repeated whenever there is the like necessity for such an operation.

These are the most approved methods, either for totally removing, or at least giving ease in these very troublesome and painful complaints ; but if they should all fail, then the recourse should be had to the following helps.

External fomentations, emollient, relaxing and anodyne embrocations, and above all the semicupium, or warm bath, which, when the patient has sat in it up to the middle for a considerable time, has often been found serviceable after all other methods have failed.

The frequent injecting of emollient and lubricating clysters will not only answer the purpose of internal relaxing fomentations ; but, if assisted with gentle purgatives, will promote the evacuation of the excrements, on both which accounts they will be very useful.

But if, after all, the event does not answer our expectations, then recourse must be had to opium, which, when given in such quantities as various circumstances and symptoms require, will be the most effectual means that can be obtained for promoting the descent of these obstructing substances into the bladder, especially

ſpecially if at the ſame time it is affiſted by large quantities of mucilaginous lubricating and diuretic apozems ; a cooling and relaxing diet, with nitre, will be proper, if the patient is feveriſh ; if the pain is great, the quantity of opium muſt be increaſed ; and if the body is coſtive, it muſt be kept open by clyſters, or the oil of the Palma Chriſti, which has been recommended before.

When the bladder is the ſeat of the diſeaſe, if the concretions are not quickly and totally voided, they will ſoon become too large to be expelled whole ; and no relief is to be hoped, but from comminuting and diſſolving them.

If it should happen that too large a calculus should fall down upon the neck of the bladder, or be protruded into, and firmly adhere in the urethra or its excretory duct, a total suppression of urine will be the consequence.

As this is a most dangerous symptom, its removal must be attempted as soon as possible ; for this purpose, the patient must be placed in a supine posture, with his head and upper parts low, and his under parts in an elevated position ; shakeings and even concussions must then be tried, to cause the obstructing substance to fall back ; if these means prove ineffectual,

tual, then recourse must be had to the catheter.

But, even in these circumstances, I have often experienced the good effects of opium, which has in a very short time so relaxed the parts, that concretions of a surprizing bulk have passed through them.

Among the great number of instances, which in the course of many years have occurred to me, of the immediate ease obtained by opium, one was very singular.

A physician far advanced in life, and extremely corpulent, having been many days grievously tormented with
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excruciating pains, and a total retention of urine, occasioned by a large stone sticking in the urethra, had recourse to the warm bath ; and while he was in it, desired me to inject some of the warm water into the passage ; I did so, and the position of the stone being altered by the operation, such agonies succeeded as must have been fatal : in this exigence, another physician advised him to take directly a large dose of solid opium ; in consequence of this remedy, the severity of the pain soon abated, a sound sleep ensued, which continued all night, and in the morning a rough and hard stone, about the size of the point of the fore finger, was found in his bed, which was likewise thoroughly wetted

wetted with his urine, and from that time he continued long free from gravelly complaints.

The frequency of such events encourages me to recommend opium, as an useful addition to the soap-lye; and I make no doubt but that, by its relaxing and anodyne qualities, it will prevent the painful irritations and subsequent strictures, that sometimes supervene upon the first use of that medicine.

Upon the whole, I have good reason to hope that the lixivium which I have contrived, will produce all the good effects that can be hoped from a medicine of that kind, without the

disadvantages that attend the use of other preparations of lixivial salts and substances. I therefore earnestly recommend it, under the cautions and conditions, and combined with the other remedies that I have mentioned, as symptoms may indicate ; and what I have offered being built wholly upon experience, I hope an old man will be permitted to tell a plain tale, without affecting any ornaments of language: and even that if some inaccuracies should have escaped him, they will be forgiven.

F I N I S.

ADVERTISEMENT.

THE Lixivium recommended in this Treatise is, for the convenience of those who cannot make it themselves, faithfully prepared from the directions contained in the 135th and following pages, by WELLINGS and SLATER, Chymists and Druggists, at N^o 7. in The Poultry, London; and sold in bottles, with a glass stopper, at the price of two shillings and six pence, with particular directions for its use.





